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ABSTRACT

This monograph examines issues and problems involved in teaching geography concepts to visually and hearing impaired elementary school children. Some solutions are offered by providing a teaching unit for classroom use. The unit is designed to integrate and build upon the experiences and knowledge of all students in the class. The volume includes: (1) Preface; (2) Introduction; (3) Chapter 1--"The Sensory Impaired Child and Curriculum Issues"; (4) Chapter 2--"Children with Hearing Losses: Are They Really That Different?"; (5) Chapter 3--"Visually Impaired Children: Abilities and Needs"; (6) Chapter 4--"Developing a Unit of Instruction: The Process and a Model"; and (7) "Bibliography." Appendixes include: Social Studies; Week by Week Plan; Week Plan; The Week in Detail; The Lesson Plan; and a 26-item Unit Bibliography covering children's books, Great Lakes: resource books, Wisconsin-Indians, games, and children's books: resource books. Contains 135 references. (EH)

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Pathways in Geography Series

The National Council for Geographic Education

Beyond Seeing and Hearing

Teaching Geography to Sensory Impaired Children

An Integrated Based Curriculum

by
Sona Karentz Andrews
Amy Otis-Wilborn
Trinka Messenheimer-Young

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PREFACE

Geography materials are rich in visual aids and spatial language. As in other social studies' disciplines, content learning is cumulative and relies on a child's background knowledge and prior experiences. Because sensory impaired children do not have accessibility to auditory and/or visually based information, the results are that their regular classroom experiences may deviate substantially from that of their sighted and hearing peers. This monograph examines some of the issues and problems involved in teaching geography concepts to visually and hearing impaired elementary school children. Some solutions are offered by providing a teaching unit for classroom use. The unit is designed to integrate and build upon the experiences and knowledge of all students in the class.

It is important to clarify the lens through which to view the information presented in this monograph. We recognize that the population of students with sensory impairment varies considerably and the interaction of variables internal and external to each child makes him/her unique. Our focus is on those sensory impaired children who are mainstreamed and find their daily interactions and operations in the hearing and seeing world.

In the case of hearing impaired children, the focus is on students of families who, for the most part, are hearing themselves. The language of focus is English since it is the primary language of these students and the language of classrooms in public schools and in printed materials. Readers of this monograph should recognize the fact that they may encounter other students with hearing losses whose primary language is not English, but American Sign Language. On the basis of this perspective, the reader should note that references to sign language refer to a form of manual communication that uses English grammar for its base. This is in contrast to American Sign Language which has been identified as a unique language of the Deaf based on visual-spatial relationships.

We also recognize that we have not made mention of sensory impaired children with multiple impairments. The curriculum needs of these students require attention. Although the proposed integrated curriculum concepts are applicable to all children, the teacher may need to develop alternatives in the case of these multi-sensory impaired students according to their individual needs.

On a final note, we use the term "impairment" (hearing impairment, visual impairment, sensory impairment) to be synonymous with loss, and in no way does it imply any deficit.

INTRODUCTION

In 1988-89 there were 4,587,370 disabled children and youth, age 0 to 21 receiving educational services in the United States (U.S. Department of Education 1990). These children represent 6.7 percent of the total school aged population. Of the children with disabilities, 57,555 were classified as primarily hearing impaired and 22,743 were classified as primarily visually impaired (U.S. Department of Education 1990). Although this represents a small population, the prevalence of children with different information input modes and needs in the regular classroom continues to increase. This is in addition to the increasing number of other students identified as having "special needs," and those students who have diverse cultural, linguistic, socioeconomic, and/or environmental backgrounds. Given this, teachers are continually faced with new challenges to meet this ever increasing diversity in the school-aged population.

In the case of hearing and visually impaired children, some of these needs involve access to information and lack of experiential knowledge. Hearing impairment interferes with children's access to auditory language information and communication from hearing peers that in turn, can cause development of incomplete or inaccurate concepts about the world. Visual impairment and lack of visual experience is thought to delay cognitive spatial development: development which is considered necessary to understand the dynamics of our environment and the world in which we live.

Geography materials are rich in visual aids and spatial language. Content learning in geography is cumulative and relies on a child's background knowledge and prior experiences. The result is that the classroom experiences of sensory impaired children are restricted or altered due to deprivation of auditory and/or visually based information. Furthermore, there are psychosocial and pedagogical issues which inhibit full participation of these children in the classroom unless accommodation is provided. The results are regular classroom experiences that deviate substantially from the principles and theory behind the practices of mainstreaming sensory impaired students. In this monograph we explain some of the issues and problems involved in teaching geographic concepts to visually and hearing impaired elementary school children. We also offer some solutions by providing a teaching unit for classroom use. The unit is designed to integrate and build upon the experiences and knowledge of all students in the class.

In preparation of the monograph, it was important to clearly define the basic premises we wish to make about teaching sensory impaired children. We will present information to establish that sensory impaired children have the same general cognitive abilities and learning modes as other children. On the other hand, we will present information on the unique characteristics of these children which restrict and alter the nature of their experiences.

In the first chapter we offer general information and data on sensory impairment, a model for an integrated curriculum, and accepted guidelines for a geography curriculum. The model is an implementation of what might be called a "best practices" approach to geography instruction. Best practices in our view, reflect a focus on the child as an individual (child centered), opportunities for learning through a variety of experiences, and integration of objectives from across the curriculum.

Chapters Two and Three address the "unique" characteristics and educational needs of hearing and visually impaired children respectively. Each chapter provides specific information on the characteristics of children in this group as related to their linguistic, cognitive, and psychosocial development. This information is related to the impact of the sensory impairment on acquisition and learning of spatial and en-

vironmental information. Current practices of instructional delivery for these students and some of the tools and methods used to teach these students are also given.

Chapter Four expands on our views regarding the instructional process in geography. We use the model of an experience based, integrated social studies curriculum and outline the process of developing a teaching unit based upon a story by Holling Clancy Holling (1941) entitled *Paddle to the Sea*. Our approach to this unit was to find solutions that would enhance the learning of the sensory impaired child, instead of separating and isolating them in the classroom. The Unit benefits all children in the classroom, and allows the sensory impaired child to participate fully. The unit serves as an example of how the model of an experienced based integrated curriculum works. A series of appendices detail some of the unit goals and activities. The monograph concludes with a bibliography of citations.

CHAPTER 1:
THE SENSORY IMPAIRED CHILD AND CURRICULUM ISSUES

SENSORY IMPAIRMENT

The sensory impaired children discussed in this publication are those with hearing or vision loss. Their range of impairment varies considerably within each of these groups.

HEARING IMPAIRMENT

Hearing Impairment is one of the most frequently occurring disabilities in North America today (Sullivan and Bourke 1980). In one of the most comprehensive studies to date, it was found that 5 percent of all school-aged children had a hearing loss outside of the normal range (Eagles, Wishik, Doerfler 1963). Students with hearing impairments receiving special educational services in public schools represent approximately 1 percent of the school-aged population (U.S. Department of Education 1990 Report to Congress).

Hearing impairment in school-aged children and youth covers a broad continuum ranging from mild (26-40 decibels), moderate (41-55dB), moderately severe (56-70dB), severe (71-90dB), and profound (greater than 90dB) (Goodman 1965). Hearing levels for the classification of students are based on the average hearing for pure tones across the speech frequencies (i.e., PTA (Pure Tone Averages) across 500Hz, 1000Hz, and 2000Hz) in the better ear.

Other terms which are used to describe this population are "hard of hearing" and "deaf." Also the term "Deaf" (capital D) is used to refer to a population of individuals with hearing loses who, not on the basis of amount of hearing loss alone, are members of a Deaf community and culture. Although there is no consensus within the profession on the exact definitions of these groups, most agree that the discriminating characteristics are a student's ability to access language through the auditory channel. Various factors impact a student's use of audition including a) the degree of hearing loss, b) the age of onset (before or after the critical language learning period), c) etiology, and d) type of loss (sensori-neural or conductive). Additionally, early identification of hearing loss and the consistent use of amplification impact the function of audition in language learning.

The Individuals with Disabilities Education Act defines the terms hard of hearing and deaf as follows:

> "Deaf" means a hearing impairment which is so severe that the child is impaired in processing linguistic information through hearing with or without amplification, which adversely affects educational performance. (300.5.1) Hard of hearing means a hearing impairment, whether permanent or fluctuating, which adversely affects a child's educational performance but which is not included under the definition of "deaf" in this section. (300.5.3)

Because the Federal definitions are broad and "inclusive," many states have established numeric criteria which qualify students for receiving special education services. Students may be required to have a PTA of

at least 25dB or 30dB in the better ear before schools will consider whether or not the hearing loss is impacting development or school performance. This leaves a number of students with measurable hearing losses in the regular classroom without special education support services. Recently, research has documented that even mild hearing losses have a potential impact on language development and achievement (Finitzo, Gunnarson, and Clark 1990: Giebink and Daly 1990).

Approximately 16 out of every 1,000 students are hard of hearing and at risk for the potential impact of hearing loss (Ross, Brackett, and Maxon 1982). In a survey by Reis (1986) for the Center for Assessment and Demographic Studies, it was reported that most of the 68,000 students with hearing impairments receiving educational services in 1982 had severe to profound hearing losses (unaided Pure Tone Averages of 71dB or greater).

There are a variety of possible interventions for students which are unique to hearing impairment. The most common is the use of amplification either through personal hearing aids or assistive listening devices (the teacher wears a microphone and the student an FM microphone and amplifier). Ross, Brackett, and Maxon (1982) found that about 71 percent of integrated students with bilateral hearing losses, mild to severe, wore personal hearing aids. For hearing impaired students in regular classrooms who need consistent visual access to language, oral or sign language interpreters are employed. An estimated 4,000 interpreters were working with hearing impaired students in educational programs in 1989 with an increasing demand for more (Stuckless, Avery, and Hurwitz 1989). Recently, cochlear implants have been approved by the Federal Drug Administration for use in children with profound hearing losses. Subsequently, their use in children has increased (Tyler, Davis, and Lansing 1987). A cochlear implant is an electronic device that provides for some acoustic information through electrical waves to be delivered to the inner ear. Depending on the individual needs of the student, all of the interventions listed above may often be supplemented by educational services.

VISUAL IMPAIRMENT

Although we often tend to think of children with visual impairment as blind, the classification of these children can range from moderate (20/70 and 20/200 in the better eye), severe (20/200 to 20/400 in the better eye), profound (20/500 or less in the better eye), and total (no light perception or perceives but does not localize light). Children without binocular vision (inability to use both eyes simultaneously to focus), lack of accommodation (inability to hold a steady fixation), and tunnel vision are also classified as visually impaired.

The legal definition of blindness in the United States is the ability to see only the largest symbol on the Snellen eye chart, at twenty feet, with the better eye, corrected if applicable (with glasses or contact lenses), or restricted visual fields of twenty degrees or less "tunnel vision," regardless of central visual acuity (Bishop 1987). States often use numerical criteria to qualify students for special educational services and the visual handicap is determined by a medical examination by an opthalmologist or optometrist. Categories of functional visual efficiency are measured based on visual fields, ocular motility, binocular vision, and accommodation. Most often, a visual acuity of 20/70 or defective visual fields has served as the eligibility criterion for placement. Recent survey results by Harley, Garcia, and Williams (1989), however, reveal some schools have eased that standard to 20/40. The question as to whether a child's degree of visual impairment is a handicap is a multifaceted, complex question with no concrete medical solution.

The philosophical trend in defining visual impairment is becoming more functional rather than purely legal (Bishop 1987, 53). Although visual acuity appears to still be the dominate factor in determining placement; teachers, eye specialists, and administrators of special education programs often work together as a

team to conduct an individual assessment of visual functioning to identify children with special needs (Harley, et al. 1989). The Individuals with Disabilities Education Act has eliminated the numerical measurements in its definition and defines visual impairment as follows:

> Visually impaired means a visual impairment which, even with correction, adversely affects a child's educational performance. The term included both partially seeing and blind children. (300.5.11)

There were 22,743 school-aged children with visual impairment receiving special education services in 1988-89 (U.S. Department of Education 1990). The majority of these visually impaired children are classified as having "low vision." Low vision, or partially seeing students have corrected visual acuity of between 20/70 and 20/200 (Stephens, Blackhurst, and Magliocca 1982). These students use optical aids and machines to read standard print material or read large print material. Children who have very low acuity or who are blind rely on tactual/braille materials. A sample survey of 351 teachers of visually impaired students (Harley, et al. 1989) revealed that 13 percent of the children served in both local and residential schools were blind, 50 percent were low vision, 14 percent were blind with multiple handicaps, and 22 percent were low vision with multiple handicap.

Of the 26,433 legally blind school-aged children (survey by Willis (1976)), 18 percent were totally blind, 52 percent used large print or regular print, 3 percent used a combination of large print and braille, 21 percent used braille only, and 24 percent used aural methods. These figures are significant because the differences between print and tactual media have a direct impact on the amount, nature, and characteristics of the educational materials a teacher can provide, as well as on the mode of acquisition of information.

MAINSTREAMING SENSORY IMPAIRED CHILDREN

There is a federal mandate for receipt of a "free appropriate education (FAPE)" under the Individuals with Disabilities in Education Act (IDEA, formerly the Education of All Handicapped Children Act, EHA) for students with hearing and visual impairments. As a result of this law, the number of sensory impaired children attending residential facilities (State schools for the Deaf and Blind) has steadily declined. The IDEA's report to Congress in 1988 showed that 41,040 (72.7 percent) of hearing impaired students were served in public school programs. This compares with 38 percent in the 1970s (Karchmer and Trybus 1977). A similar trend was evident for students with visual impairments, with 17,116 (76.6 percent) served in public school programs. In the case of visually impaired students, this represents an increase since 1960 when 53 percent of these students were served in public school programs (Curry and Hatlen 1988).

The philosophy behind mainstreaming is to provide mildly handicapped children with equal educational opportunities in the least restrictive environment. The stated preference (from the IDEA) is for the provision of educational services within the regular public school environment, with non-disabled peers when appropriate. The IDEA was enacted in 1975, ensuring mandatory services for individuals ages 6 to 18. These age limits will expand to include individuals ages 0 to 21 to meet the needs of infants, toddlers, and preschool children with disabilities with the full implementation of P.L..99-457 in 1991. The responsibility for meeting the IDEA and EDA mandates rests with public schools. According to the Twelfth Annual Report to Congress (1990) 4,324,220 students with disabilities (93.3 percent), ages 0 to 21, were served by public school agencies in 1988. Less than 7 percent (263,150) received educational services in state operated programs. Proportionately, the greatest number (48 percent) of students with disabilities were at the early childhood and elementary levels.

Mainstreaming occurs through a variety of placement models and there are many forms of instructional delivery for sensory impaired children. Typically, instruction is provided on a continuum which ranges from total integration to segregation. Integrated instruction ranges from the "regular classroom" to "resource rooms." Students in the "regular classroom," spend at least 80 percent of the school day in a classroom with students who are not sensory impaired. In the "resource rooms," special education services are provided outside of the regular classroom for 21 percent to 60 percent of the school day. Segregated instruction is usually in the form of a "special class" or self-contained class where 60 percent or more of the school day is spent in a separate classroom. The table below illustrates the placement patterns in 1988 for children with sensory impairments in public school programs.

	Visually Impaired Percent	Hearing Impaired Percent
Regular Class	37.7	24.4
Resource Room	25.6	20.9
Special Class	20.8	35.2

The most prevalent service delivery model for visually impaired children is the regular classroom with the use of an itinerant teacher (Harley, et al. 1989). These teachers spend a portion of the day or week with the visually impaired student. The teacher provides the student with special academic training, communication skills, and materials. The most prevalent service delivery mode for hearing impaired children with significant hearing losses is the special class. The rationale most often given for this is that these students have unique communication needs. According to the 1989-90 Annual Survey of Hearing Impaired Children and Youth some form of sign language is used with the majority of these students (88 percent with profound losses, 74 percent sever losses, and 24 percent less than sever) (Schildroth and Hotto 1991). Integration into the regular classroom, therefore, requires interpreting services.

Although students' needs for a particular placement often are related to the severity of their sensory impairment, there has been some debate over how to define Least Restrictive Environment (LRE) and whether it should be the primary criterion for identifying placement for handicapped children. The direction has been to integrate and decentralize the education of learners with special needs. However, there is some controversy in the field regarding whether integrated placement is the most appropriate. Additionally, there is concern that integration really does not take place, but instead becomes social isolation (Spungin 1989). Arguments have been made by professionals in support of a "Most Appropriate Placement" (MAP) environment (Commission Report on Education of the Deaf 1988; Curry and Hatlen 1988). This model considers the student's unique skill areas and academic needs. It differs from the least restrictive environment in that placement teams develop a program specific to the individual needs of the student rather than look for an environment that is appropriate. Although, traditional educational placement has deemed integrated placement as the most desirable, supporters of MAP argue that this should not necessarily be the case (Curry and Hatlen 1988).

Many school programs have implemented models that actively integrate special education students into the regular classroom program. These models include various cooperative and supportive arrangements.

The responsibility for the education of students with disabilities is shared between special education and regular education teachers. Educational trends, such as the Regular Education Initiative (REI) have increased and changed the responsibilities of the regular classroom teachers in this respect. Jenkins, Pious, and Jewell (1990) identify five charges resulting from REI for classroom teachers. They are:

1. Educating all students assigned to their classroom.

2. Making and monitoring instructional decisions for all students in their class.

3. Providing instruction that follows a normal developmental curriculum.

4. Managing instruction for diverse populations.

5. Seeking, using, and coordinating assistance for students who require more intense services than those provided to their peers.

Jenkins, Pious, and Jewell (1990) also write:

> We believe that with sufficient personnel and material resources, it would be possible to deliver an appropriate instructional program in the regular classroom to any student, no matter what their handicap, with the possible exception of students who are given to extreme violence and aggression (p. 485).

It is evident that it is becoming the predominate responsibility of the classroom teacher to integrate sensory impaired children into classroom activities. In our opinion, a truly integrated curriculum model, built upon the concepts of integration and experience is needed to do this.

A CURRICULUM MODEL

The design of curricula and the implementation of instruction in elementary classrooms must address the needs of a diverse population which includes students with visual and hearing impairments. Curriculum models proposed by Hilda Taba and Jerome Bruner emphasize not only the product but, more importantly, the process of curriculum design and implementation. Although both Taba and Bruner theorize on this process, their theories are easily translated into practice.

The curriculum model described in this section, focuses on two major parameters: integration and experience. The idea of an integrated curriculum has been proposed for use with special education students, students in general education, and gifted students (Kataoka & Patton 1989, Swenson 1991). The model proposed here, however, identifies the need for planning meaningful experiences. In the following section, these parameters are discussed and presented in a visual model. The parameters are operationalized in Chapter Four of this publication through the development of a social science instruction unit which addresses not only the needs of students with visual and hearing impairments, but of all students who in some way add to the diversity of a classroom.

INTEGRATION

Integration within the school curriculum relies on two ideas which define the "content" of instruction. The first idea emphasizes conceptual content and the second targets academic content.

Integration of the conceptual content refers to the infusion or weaving of broad concepts into the curriculum. Concepts can be thought of as strands that serve as hooks upon which more factual content is hung. These concepts also create the substance which fuses and restructures related concepts in the minds of learners.

Instruction which wraps traditional curriculum content around broad concepts looks very different from instruction which is topic-centered and factually based. According to Taba, Durkin, Fraenkel, McNaughton (1971):

> A new perspective is appearing on the nature of content to be used, with emphasis being placed on those elements of content believed most durable (such as concepts and generalizations) rather than on the acquisition of essentially factual information alone.....More and more we see an emphasis upon an in-depth study of fewer topics and a reduction of the superficial 'coverage' aimed for in the past. (p. 1)

Broad concepts develop hierarchically across time and parallel the experiential and cognitive development of the child. Concepts are reinforced and expanded through the elementary grades in a manner depicted by Bruner and Taba as a spiral (Bruner 1977, Taba et al. 1971). The spiral signifies a curriculum process through which concepts are revisited throughout the child's education. Hence, concepts develop in breadth, depth, and complexity across time. Bruner explains:

> The basic ideas [concepts] that lie at the heart of all science and mathematics and the basic themes that give form to life and literature are as simple as they are powerful. To be in command of these basic ideas, to use them effectively, requires a continual deepening of one's understanding of them that comes from learning to use them in progressively more complex forms. The spiral curriculum [facilitates this because it] turns back on itself at higher and higher levels. (p. 12-13)

Bruner proposes that a child's conceptual knowledge is developed through three curriculum processes: acquisition of information, transformation of information, and evaluation of information (Bruner, 1977). Through these processes, a child's concepts are initiated through direct experience, then, generalized, modified, and/or refined as additional knowledge and experience is acquired.

Integration of academic content in the model refers to knowledge and skills from various academic content areas which serve a vital purpose in learning. Knowledge and skills typically contained within the math and science area and general abilities in reading, writing, speaking, and listening are tools that assist in accessing and manipulating information. These tools are a means rather than an end and become an integral part of the teaching and learning process.

Bruner (1977) writes that "the object of any act of learning, over and beyond the pleasure it may give, is that it should serve us in the future (p. 17)." Educators agree that the purpose of education is not to teach isolated skills within isolated content areas. The goal of education is to develop knowledge and skills that

provide individuals with functional strategies and confidence for independent and continuous life-long learning. The integration of knowledge and skills from across the curriculum into meaningful study provides optimal opportunities for the development of critical thinking skills and strategies that enhance students' ability to learn.

There has been an explosion of knowledge over the past decades which continues to grow almost exponentially. Identifying and teaching students the breadth of knowledge deemed "critical" is no longer a realistic goal. It is more efficient to work toward depth in specified content areas in order to develop independent learning strategies that can be applied to other areas. Activities, therefore, should fulfill multiple objectives drawn from across the school curriculum and applied to the process of discovering the world in which we live.

EXPERIENCE

The second parameter of the proposed curriculum model emphasizes experience and the language and communication around experience. For young children, experience creates the foundation for later cognitive and linguistic development. The ability to learn from new experiences is tied to prior experiences and their interpretations, storage, retrieval, and representation.

Katherine Nelson (1986), in her theory of cognition and language, emphasizes the role of a young child's direct experience on the development of what she calls "event representations." These representations are referred to as "scripts" which are generalized structures of action sequences organized around a goal. According to Nelson, "scripts specify actors, actions, and props used to carry out those goals within a specified circumstance (p. 13)." Examples of common scripts include checking a book out at the library, eating at a fast food restaurant, and routine games or play sequences. It is important to note that a script embodies parameters of the physical world and aspects of social interaction. Event representations in the form of scripts are important to cognition since they are considered to be the bases from which future cognitive development and knowledge spring.

Bruner (1977) offers a useful taxonomy for viewing the relationship between experience, learning, and language. He asserts three levels of experience which provide the means for a child's acquisition of information: enactive (direct experience), iconic (experience mapped onto some visual/graphic representation which links the experience with language), and symbolic (experience which is mediated through language).

According to Bruner, these three types of experience are hierarchical and interactive in nature. A young child relies primarily on direct or enactive experiences in learning. These direct experiences are continually linked with language (symbolic experience). The "instructional" process engaged in by parents and teachers, for example, link direct experience with iconic (e.g., pictures, diagrams, illustrations) and symbolic (oral language, printed materials) representations. Bruner's thoughts on the role of experience in the initial development of cognition and language parallel Nelson's theory which highlights the importance of event in development.

As the child becomes more adept at receptive and expressive use of language in communication, the need for true enactive experiences in developing conceptual knowledge decreases. The acquisition of concepts through experience mediated through language and communication becomes the primary means for learning. Early enactive experiences, however, provide the base for utilizing such communication "experiences" to build increasingly more complex concepts.

Communication experiences are embedded within social interaction. The importance of communication and social interaction is also supported by research that positively relates these skills with academic achievement (Gumperz 1981). Communication within the classroom is a student's way of accessing and manipulating content. Examples of critical communication skills which allow a student to participate successfully in classroom discourse include entering and exiting conversations, understanding the rules of various types of discourse, assessing the shared knowledge of conversational partners, recognizing and repairing miscommunications, implementing strategies for gaining and giving information, and making use of various forms or styles of communication.

Figure 1 illustrates the parameters of the "integrated, experienced-based" curriculum model. The braided strands represent the development of curriculum content, the child, and the "tools" inherent in various academic content. Communication skills along with literacy development are some of the critical "tools" which are developed along side content and in relation to the child's own development. The vertical lines running through the braid represent broad conceptual strands which are consistent throughout the curriculum in the elementary years. The same concepts are found in the first grade as in the sixth grade but are more developed and more complex in nature. Finally, the model reflects the changing emphasis on enactive and symbolic experience. As the child develops, the need for enactive experience is reduced (illustrated by lighter shading) with a commensurate increase in the child's ability to use symbolic experiences with a more sophisticated literacy focus.

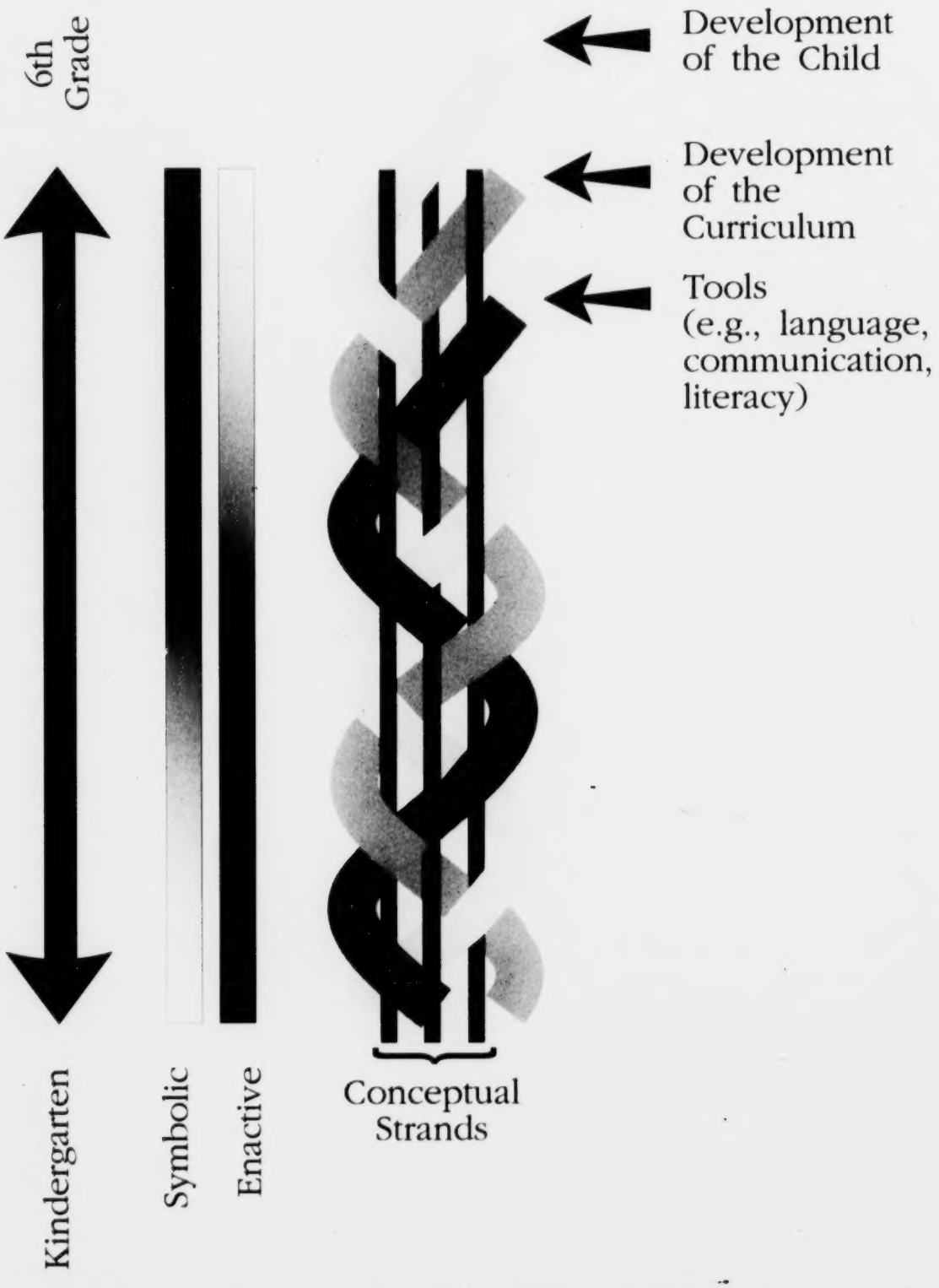
CHILD-CENTERED

An integrated, experienced-based curriculum process emphasizes the notion of child-centered instruction. Having identified the fact that students come to any classroom with various sets of skills, knowledge, and experiences, understanding where the child is and working from that point becomes critical to the teaching and learning process. The child cannot be "fit" into the curriculum; the curriculum must fit the child.

A child-centered focus influences the design of the curriculum and associated instructional activities. The teacher's development of "shared" knowledge of his/her students promotes the classes' ability to interact around meaningful curriculum content. Therefore, "initiating experiences," which bring students together with shared understandings about content; "deepening experiences," which charge students with the task of cooperatively deepening their understandings about content; and "culminating experiences," which illustrate the breadth of content, are important to the curriculum process. These experiences are developed within the unit presented in Chapter Four.

Each child comes to the classroom with a set of experiences which may or may not match those of the other children. In the case of children with sensory impairments, their experience may be limited or altered. Careful planning of direct and indirect experiences within the curriculum creates the potential for developing accurate concepts on which to build knowledge. Chapters Two and Three identify the specific characteristics of sensory impaired students and how their experiences have impacted their acquired background knowledge. The remaining part of this chapter is devoted to an explanation of established goals and objectives of a social studies curriculum developed at the national level.

Figure 1


6th Grade
Kindergarten
Symbolic
Enactive
Conceptual Strands
Development of the Child
Development of the Curriculum
Tools (e.g., language, communication, literacy)

SOCIAL STUDIES CURRICULUM
GOALS AND OBJECTIVES

Place is an important concept in everyday life and an integral component in the specific study of geography, or the more broad field of social studies. For this publication, we have adopted the definition of social studies as outlined by the National Commission on Social Studies in the Schools (National Commission 1989, ix):

> Social studies includes history, geography, government and civics, economics, anthropology, sociology and psychology, as well as subject matter drawn from the humanities: religion, literature, and the arts . . . social studies combines those fields and uses them in a direct way to develop a systematic and interrelated study of people in societies, past and present.

Understanding where things are, how they relate to one another, and wondering why they are there are concepts that rely on knowledge, interpretation, and experiences. As previously mentioned, experience is replete with linguistic and visual information which is combined with knowledge and interpretation and stored in a meaningful way so that a child may later retrieve, reshape, and build basic concepts. Salter (1989), outlines four basic skills that allow students to build concepts about place and to better understand the world around them. The first is observation: "What do you see here?" The second is speculation: "Why does this look this way, or why is this the way it is?" The third is analysis: "Has it always been like this?" The fourth is evaluation: "Is this the way it has to be?"

Based on the Commission, a well developed social studies curriculum must accomplish the following:

1. Instill civic, cultural and volunteer activities.
2. Be consistent and cumulative from kindergarten through 12th grade.
3. Offer a perspective of time and place.
4. Not be selective of a particular time and place.
5. Show the connections between the physical and human sciences.
6. Be viewed as a way of analyzing and processing information as opposed to just receiving knowledge.
7. Incorporate reading, writing, debating, and role-playing.
8. Include a variety of source information (maps, photographs, artifact . . .) and use these with multimedia tools (audiovisual materials).

The goals of such a social studies program are to enable students to be active participants in society, to see themselves as part of a larger human milieu in time and space, to have an understanding of history, geography, economic, political and social institutions, traditions and values, and to understand people of

different cultures. The ultimate goal is "the development of thoughtful Americans who have the capacities for living effective personal and public lives" (National Commission 1989, 4).

The Commission's 1989 Curriculum Task Force has proposed a structure for "A Social Studies Curriculum for the 21st Century." Goals have been established for each grade level and suggestions are given for how to achieve these goals in the curriculum. The following goals and suggestions are summarized from the Commission's 1989 report.

The focus for grades K-3 is to interest students in social studies and to concentrate on the needs relevant to the child. There should be an effort to balance concepts and information about local, national, and global places. Information about continents, different people, and cultures can be developed throughout the K-3 grades. Neighborhoods are the suggested geographic focus for kindergarten.

Community events, places and concepts are introduced at the first grade level. Geographic skills (use of maps and globes) should be integrated into the curriculum. By the end of the third grade students should know such things as the continents, major countries, and climatic zones. Teachers are urged to use maps and time lines to connect events to "a matrix of place."

A systematic approach is recommended for grades 4-6 with courses specific to geography and history. The initial focus of geographic instruction would be on physical geography (climate, physical landscape). This knowledge would then serve as a framework for looking at the human patterns and interaction. By the sixth grade students should possess a lot of factual information and the concept of chronology should be firmly established.

These national recommendations are evident in practice in local geography and social studies curriculums. For example, the overall goal of the social studies program in the Milwaukee Public School System (MPS) is the "preparation for citizenship." The K-12 program is designed to provide all students with opportunities for understanding the world by learning about other places, peoples, and societies. This is done so students develop an understanding of different races and cultures; and to enhance their personal frames of reference. MPS has identified specific exit level expectations for the social studies for each grade level (Milwaukee Public Schools 1986). Enabling learner expectations for different strands (subjects) within the social studies curriculum are also established. The exit level expectations and strands for Grade 4 are presented in detail in Appendix A.

It is evident from these national and local curriculum objectives that geography and social studies are considered to be a central part of the elementary curriculum. The systematic study of the disciplines within the social studies are important for the successful transition from childhood to adult life (National Commission 1989, p. 5). It is unfortunate, as the Commission points out (p. v) that "social studies curriculums are often a collection of isolated or fragmented subjects and skills, not well integrated with one another or into the curriculum." Given the importance of social studies to the development of a good citizen with an appreciation and understanding of different places and people, it should be no less important for hearing or visually impaired children to develop these same concepts and knowledge about society and the environment in which they live. These students must be allowed to "participate fully in all aspects of the education program . . . Any temptation to leave them out of regular geography and to concentrate only on basic literacy skills should be resisted (Miller 1982, 263)."

CHAPTER 2
CHILDREN WITH HEARING LOSSES: ARE THEY REALLY THAT DIFFERENT

> "Learning is based on the ability to integrate stimulus from all five senses, logically, the learning potential of all five senses will be affected (Quinsland & Van Ginkel 1990 (p.282)."

Learning may be defined as the building of basic and associated concepts through the acquisition and processing of information. The interaction between characteristics of the hearing impaired individual and the environment creates a set of circumstances under which learning takes place.

Three important factors contribute to concept development and learning in children with hearing impairments as with all children; cognitive, linguistic, and psychosocial development. Although these factors are discussed separately, in reality, their development and impact on learning are interwoven. In this chapter, characteristics often associated with hearing impairment are presented and related to beliefs about learning in children.

COGNITION

The most common axiom offered for teaching students with hearing impairments is "make it visual." While it is true to some extent, that the visual sense compensates for an auditory loss, the axiom ignores the necessary cognitive and linguistic functions that allow for not just the perception of images, but the processing of information. Cognitive processing is responsible for the acquisition of information and the representation of knowledge in memory (Anderson 1975; Gagne 1977).

Questions regarding the effects of hearing impairment on cognition have been examined throughout this century. Three historical stages of thought which attempted to explain the relationship between deafness and intelligence can be traced. The first stage determined deaf individuals to be intellectually inferior. This was attributed to their poor performance on paper and pencil measures of intelligence (Pintner & Reamer 1920; Pintner, Eisenson, & Stanton 1941). The second stage considered deaf individuals to be cognitively different. Myklebust (1960) concluded that although hearing impaired individuals may not be quantitatively different, they were qualitatively different; that is, they functioned cognitively at a more concrete than abstract level. The belief that hearing impaired individuals were intellectually normal was reflected in the third stage (Furth 1966; Rosenstein 1961; Vernon 1967).

Research during the third stage examined the performance of hearing impaired individuals on Piagetian tasks rather than traditional intelligence tests. Generally, there is evidence that children move through the sensorimotor and preoperational stages normally with the rationale that most tasks rely on visual perception and processing (Paul & Quigley 1990). On the other hand, the performance of children with severe and profound hearing losses, on cognitive tasks associated with concrete and formal operations demonstrated delays. Delays, in these cases, have been attributed to experiential deficits and an inadequately developed language and communication system (Paul & Quigley 1990).

Having determined the cognitive potential of deaf individuals to be normal, inquiry turned to examining cognitive processing; particularly as related to short and long term memory. How hearing impaired individuals process and store oral and sign language into memory has been the focus of several studies. An extension of that research has examined hemispheric specialization in language processing (e.g., short term memory) and its effects on cognition and language.

Short term memory (STM) is called the working memory and holds a limited amount of information. It facilitates problem solving and the flow of information into long term memory. It is also critical to the processing and use of language which is particularly difficult for many children with hearing impairments.

The recoding of language into a speech-based or phonologic code is the most efficient means for handling sequential information, which is the case with oral language and print. Many severely to profoundly hearing impaired individuals, however, depend primarily upon a non-speech based recoding strategy. This means that information is recoded into signs, fingerspelling, and/or print, and stored in short term memory (Greenberg & Kusche 1989; Hirsh-Pasek & Treiman 1982). Speech-based coding can be found, however, in hearing impaired individuals with less severe hearing losses and is associated with the development of oral and written language and overall academic achievement (Paul & Quigley 1990). Average and above achievement has been found in students who use sign language communication and whose speech is unintelligible but who draw upon multiple coding strategies (including speech-based) for STM storage (Lichtenstein 1985). Coding strategies, whether auditorily or visually based have important implications regarding hemispheric specialization and learning.

It is generally acknowledged that the left hemisphere is a serial processor for verbal sequential information; processing spoken language is a serial skill (Gordon 1974; Hirsh 1967; Tallal 1981). The left hemisphere, therefore, is important to learning through language. The right hemisphere, on the other hand, is a simultaneous processor for visual spatial information. Processing sign language is thought to be a simultaneous skill.

In a recent study, the verbal sequential performance in a group of hearing impaired individuals was found to be below average and positively related to academic achievement. Conversely, visual spatial skills were average and above and showed weak relationships with academic achievement (Craig & Gordon 1988). According to the researchers, "the effects of the restriction of sequential temporal information may reduce the development of the left hemisphere. Additionally, dependence on visual spatial information may potentiate right hemisphere development. Heavy right hemisphere development may restrict or neglect the development of the left hemisphere." (p. 31)

Although these results are not definitive, they do strengthen beliefs about the relationship between cognition and language and the role that auditory memory plays in learning through language. Other studies have shown equivocal results regarding language processing.

In summary, results of the study of cognition in individuals with hearing impairments indicate that, although potential is equivalent, there may be differences in aspects of cognitive processing for some hearing impaired individuals. Mostly, these results are applicable to children with severe to profound hearing losses who use an English based form of sign language as a primary communication system. The implications are that the development of a speech base facilitates cognitive and linguistic development. These factors bring to the forefront the link between language and cognition.

LANGUAGE

It is on the development and use of language that the impact of hearing impairment is most evident. Competence in communication is reflected through oral and/or sign communications, written language and reading. Each of these areas will be discussed as they relate to children with hearing losses. First, however, a review of the communication systems used in instructional programs for children with hearing impairments and a brief review regarding theories regarding language development provide a background for the discussion regarding language characteristics to follow.

COMMUNICATION METHODS

Various communication methods are used with hearing impaired students in order to develop whatever hearing abilities the students have and to make communication and language visually accessible. Communication methods vary with respect to the nature of the language input (English or American Sign Language) and the nature of the modality (oral or manual) (Quigley & Kretschmer 1982). Aspects of communication that serve to supplement or support oral English (OE) include audition (with some form of amplification) and speechreading. Manually Coded English (MCE) is a sign system which follows English word order and correlates visually to English grammatical markers (e.g., -ed for the past tense, -s/-es for plurals). OE is the system of choice for the majority of students who are classified as hard of hearing while MCE is the most prevalent sign system used in instruction with severely to profoundly hearing impaired students.

American Sign Language (ASL) is a language different from English that uses aspects of space, movement, and timing to communicate linguistic concepts. ASL is associated with the Deaf community and culture. Some programs have begun implementing "bi-lingual" instruction in English and American Sign Language. In education, its use is most prevalent in state operated programs such as schools for the deaf. It is most often the case, however, that a combination of communication methods or systems are used with severely to profoundly hearing impaired students.

THEORIES OF LANGUAGE DEVELOPMENT

Various theories about the relationship between cognition and language have been generated over the past century. Theories and related research are important to those who work with children with hearing impairments because they influence the direction of language instruction and interaction with the student. These theories can be classified into three positions.

a) Language is dominant as language is primary and directs the development of concepts (Whorf 1956).

b) Cognition is dominant as cognition precedes and accounts for language development (Piaget 1979).

c) Cognition and language are autonomous and function independently of each other.

More recently, language theorists have emphasized the role of the interaction between the child and the social environment on language development and cognition. The relationship between cognition and language is viewed as reciprocal, that is, linguistic input influences thought and thought influences language (Bruner 1983; Vygotsky 1978).

The interactionists' and the cognitive dominant views have had the strongest influence more recently upon instruction for students with hearing impairments. Experience in both cases is given a pivotal role. In the case of the interactionists, however, experience includes not only direct experience with the physical environment, but also communicative experience within the social environment.

Much of the knowledge acquired through experience is incidental and relies on intact visual and auditory mechanisms. Children with hearing impairments, therefore, miss a lot of information transmitted incidentally through oral language and communication. Concept development is often affected.

The information that the average hearing-impaired child of normal hearing parents [who do not sign] acquires incidentally is likely to contain missing components and the child either fills in the gaps by making appropriate or inappropriate inferences, or simply stores incomplete information. (Yoshinaga-Itano & Downey 1986, p. 47)

Concept development, therefore, relies on cognition and language within a communication framework.

COMMUNICATION COMPETENCE

KNOWLEDGE OF ENGLISH

Because of the difficulties in acquiring English, a broad range of literacy skills, including reading, writing, and "through the air (oral or signed)" communication often are affected by the presence of hearing impairment. Potential effects of hearing impairment on expressive communication including oral and written language are discussed below. It should be noted, however, that the development of oral language in children with hearing impairments has been found to follow a pattern consistent with that of hearing children (Kretschmer & Kretschmer 1978). Additionally, written language contains the same aspects and develops normally in children with hearing impairments (Conway 1985; Ewoldt 1985.) This fact, in and of itself, has important implications for instruction.

Research on the development of oral language in children with hearing impairments indicates that although the syntactic aspects of oral language develop in much the same order as their normal hearing peers, the rate of development may be slower (Hess 1972). Knowledge of morphological aspects of language also develop in the normal sequence and may be reflected in their speech. Morphemes are the smallest units of meaningful language and include prefixes, suffixes, prepositions, etc.

A child's speech communication also reflects the effects of the hearing loss. Grammatical aspects (syntax and morphology) may be omitted because they are outside of the child's range of hearing. The severity of the hearing loss and its configuration across the speech frequencies impact how knowledge about language is mapped into oral communication. These factors affect overall intelligibility of speech and often make it difficult to assess a child's actual knowledge of English grammar. Examining other forms of communication, such as written expression and reading, may provide more information about competence in the grammatical aspects of language. Also, there is more to communication than English form. The use of language is important to the notion of communication competence.

Pragmatic language refers to the use of language in meaningful contexts. Aspects of syntax (grammar), semantics (meaning), and phonology (speech) are related to and depend upon the communication situation in which they are used. Important to this discussion are communication skills which are required for classroom functioning since these skills are related to successful participation in the classroom (Cazden 1979; Wilkinson 1982; Olson 1982).

Research on the pragmatic skills of children with hearing impairments has examined basic pragmatic functions of linguistic intents such as requesting, protesting, commenting, etc. (e.g., Dore 1974; Halliday 1975). Once again, in young children developing language, the same basic intents in the same order were expressed as normal hearing children (Skarakis & Prutting 1977). In many cases, communication was developed and/or augmented by gestures (Curtiss, Prutting, & Lowell 1979).

Another line of study focused on the discourse skills of children with hearing impairments (e.g., strategies for entering and exiting, topic maintenance and elaboration, clarification, and repair). It is generally agreed that these skills are more difficult for children with hearing impairments because of limitations on auditory/linguistic cues which signal conversational twists and turns. Ross, Brackett & Maxon (1982) found that conversations one-on-one with familiar peers were easier than group discussions for students with hearing impairments. Additionally, entering and exiting conversations and maintaining and elaborating on an established topic were difficult.

READING AND WRITING

A child's development of oral and written language is interrelated. Written language, therefore, also often presents difficulties for children with hearing impairments. Numerous studies have documented an overall delay in written language. The focus, however, has been at the level of the sentence. Productivity, syntax and overall complexity of written language were analyzed. These results provide very little information regarding the broad issues around the process of writing or writing as a form of discourse.

At the sentence level of analysis, for example, the sentence lengths of hearing impaired students have been found to be shorter than those of their hearing peers (Heider & Heider 1940; Yoshinaga-Itano 1983). Children with hearing impairments produced sentences which were less complex and demonstrated little flexibility in the use of various sentence structures (Heider & Heider 1940 & Yoshinaga-Itano 1983). Finally, as in oral language, there were omissions of some of the morphological aspects of the language.

Sentence level studies focus on syntactic aspects of written language such as sentence construction, grammar, and word usage. Only a few studies evaluate written products beyond the sentence level. Those studies have examined the structure and content of written compositions. Hearing impaired students' compositions that were judged as "good" had well developed, cohesive content and they focused on making their composition readable and clear. Errors in mechanics and language were evident (Gromley & Sarachan-Deily 1987).

The writing process has been a recent focus in ethnographic studies of children with hearing impairments. Conway (1985) found that kindergartners with hearing impairments used writing for the same purposes as normal hearing kindergarten children (e.g., to entertain, convey personal information). Finally, in a three year longitudinal study, Ewoldt (1985) followed the literacy development of six profoundly hearing impaired children and concluded that a process approach to instruction facilitated the natural development of reading and writing in these children.

Depressed achievement in reading has been recognized as a problem for children with hearing impairments for a long time. Studies document the fact that the average 18 to 19 year old severely to profoundly hearing impaired students are reading no better than 9 to 10 year old students with normal hearing (Paul & Quigley 1990). The annual rate of growth in reading averages around .3 grade levels per year with a plateau in growth at around the 4th grade. These results have been associated with a number of variables including level of hearing loss, age of onset, educational experiences, demographic variables, and the overall development of language and communication.

For hard of hearing students, equivocal results regarding reading achievement have been documented (Quigley & Thomure 1968; Jensema & Trybus 1975; Reich, Hambleton & Houldin 1977). However, there is evidence to suggest that even mild hearing losses which go undetected for periods of time and occur during early language development can impact achievement (Feagans, Blood, & Tubman 1988). On the other hand, early adequate auditory management can help to avoid reading delays (Blair, Peterson, & Vichweg 1985).

Quigley and Paul (1990) identify specific areas in reading that pose problems for children with hearing impairments. These areas include vocabulary (multiple meanings and words in various contexts), comprehension of English syntax (Quigley, Wilbur, Power, Montanelli, and Steinkamp 1976), and figurative language such as idioms and metaphors.

Strategies that children with hearing impairments implement in reading and the reading process have been investigated. Studies by Gromley (1982), McGill-Franzen and Gromley, (1980), and Ewoldt (1978), demonstrated that children can bypass unknown or difficult syntax and interpret the meaning of text when a situation is familiar to the child. Reading instruction within a context meaningful to the child, therefore, was emphasized.

A child's concept of narrative is important to reading comprehension. Studies of the narratives of children with hearing impairments usually have been accomplished through the analysis of story re-tellings and story constructions. The results of these studies indicated that the acquisition of basic story grammar (elements of narratives) develop for these children in the same way as it does for hearing children (Griffith & Ripich 1988). The re-tellings and constructed stories, however, were generally shorter. Finally, as stories became more complex (longer), errors in cohesion and completeness of the narrative increased (Griffith, Ripich, and Dastoli 1990).

In summary, English language difficulty is the result of limited and imperfect reception of auditory information. Additionally, incidental learning which contributes to the learning process for normal hearing children is reduced for children with hearing impairments who rely to varying extents on auditory and visual information in communication.

It is interesting to note that it has been suggested that many of the difficulties in language and communication might be attributed to ineffective instructional practices (Pressnell 1973). Practices tend to emphasize the form of English rather than its function within communication content. Additionally the sequence of instruction is based on English grammatical structure rather than the developmental nature of the English language in children. Traditional methods are persistent in the use of structured, unnatural instruction without the benefit of meaningful communication or well developed contexts.

Perfect hearing is not a requirement for the development of competence in communication but can slow the process when communication in academic and social contexts is not accessible, natural, or functional. Reading and writing process approaches which emphasize normal development have been shown to facilitate the development of communicative competence. Literacy in children with hearing impairments

can be developed through interaction with the reading and writing process in meaningful contexts. The development of communication skills require meaningful interaction with people.

PSYCHOSOCIAL ASPECTS

Psychosocial development refers generally to social and psychological behaviors. Critical to its development are the interactions between the child and family members, peers, and others within society. Aspects of psychosocial development reviewed in the literature on hearing impairment include personality, social maturity, social adjustment and social interaction, and parent-child interactions and family influences.

Of the three areas reviewed in this chapter, psychosocial development is the least researched and demonstrates the most equivocal findings. Numerous factors contribute to this. The most common line of research in this area has been the identification of students with "behavior disorders." Problems in interpretation of this research arise, therefore, because of the various definitions of behavior disorders used. Another factor is instrumentation which relies heavily on language, English language in most cases, which interferes with the reliability of findings (Hummel & Schirmer 1984). Finally, the variance in the population of children with hearing impairments, makes it difficult to generalize findings.

Other variables that confound the research in this area include: parental hearing status, severity of the hearing loss, etiology, and the presence of additional disabilities in the child, and aspects of educational programming including educational placement and communication modality. Here, variables relevant to the issue of integration into public school programs are discussed. It should be pointed out, however, that it is most likely that a number of variables interact to create outcomes related to psychosocial development in any one child.

PREVALENCE OF BEHAVIOR PROBLEMS

The prevalence of behavior problems in the school-aged population of hearing impaired children has been estimated to be as low as 6 percent and as high as 33 percent (Paul & Quigley 1990). Figures of the general population are cited as between 6 percent and 10 percent (Hallahan & Kauffman 1986). As noted previously, definitions and measures of "behavior disorders" create this discrepancy.

A consistent finding, however, is that problems in social adjustment are more prevalent in the population of hard of hearing children and youth than in students with severe to profound hearing losses (Jensema & Trybus 1975). Children with hearing losses at this level illustrate what often has been called an "invisible" disability. The difficulties these children may experience are not readily noticeable. Additionally, they develop a number of coping strategies that help them blend into the background and give the appearance of having no hearing loss. The use of "back channeling" communication (signalling understanding with "uh huh's" and nods of the head) and paralinguistic (nonverbal) cues to follow classroom activity are illustrative of such strategies.

EDUCATIONAL SETTING

A few studies have examined the social interaction and adjustment of children with hearing impairments as related to the extent of integration into the regular classroom. In one study, children receiving itinerant services (instruction from a teacher who visits periodically) showed the lowest incidence of be-

havior disorders (Reich, Hambleton, & Houldin 1977). Also, it was found that fully mainstreamed children were significantly better adjusted than partially mainstreamed children. A related finding in a study by Antia (1982), was that the amount of social interaction of a group of children with hearing impairments who were "partially" mainstreamed was less than for a group of their normal hearing peers. If an integrated setting is deemed appropriate for a particular child, these studies suggest that the more that child is integrated, the better the potential for social interaction and adjustment.

Two points should be made, however. First, placement into regular classrooms is strongly related to hearing loss, oral communication skills, and academic achievement. Secondly, looking at the other end of the educational placement continuum, some studies have found no measurable difference in social adjustment/behavior disorders between hearing impaired children in residential settings (the farthest from the mainstream) and regular public schools (Farrugia & Austin 1980; Quigley & Frisina 1961). It is obvious that a complex web of variables comes into play when evaluating the effects of educational setting on psychosocial development.

SOCIAL INTERACTION AND ACCEPTANCE

Examination of the social interaction patterns of children with hearing impairments has been a productive area of study. Antia (1982) compared preschoolers with hearing impairments to normal hearing preschoolers and found no difference in the amount of interaction. In another study, 57 percent of subjects with hearing impairments interacted socially as often as their hearing peers (Hoben, et al. 1979). Based on these findings, broad generalizations regarding difficulties in social integration of this population is inappropriate.

Observations of children with hearing impairments point out some unique patterns or conditions of interactions. Children have been noted to interact more frequently with their teachers than with peers (Antia, 1982). This, perhaps, is a result of the dominant role adults often play in the life of a child with a disability. A study by Brackett and Donnelly (1982) concluded that social interaction was positively related to familiarity of peers. Another factor recognized as positively related to social interaction is oral communication abilities (Brackett & Henniges 1976).

PERSONALITY AND SOCIAL MATURITY

The most significant findings in this area suggest, for the most part, predictable relationships. A positive correlation was found between achievement, IQ, and self-concept in children with hearing impairment (Hagborg 1977). This finding, of course, reiterates beliefs about all children.

An interesting line of research has focused on locus of control and impulsivity in children with hearing impairments. Findings suggest that children demonstrate an externally focused locus of control (McCrone 1979) and significantly greater impulsive behavior than hearing peers (Obrien 1987). Quigley and Kretschmer (1982) proposed that these behaviors may be in response to an overly protective and helpful environment.

To summarize, hearing impairment alters experience and makes negotiating everyday interactions with others a challenge. Research points out similarities and differences in psychosocial behaviors of children with hearing impairments. "The emerging viewpoint is that psychosocial and other aspects of development are influenced by the by-products or secondary consequences (Rodda & Grove 1987) of [hearing impair-

ment]" (Paul & Quigley 1990, p. 84). Differences between children with hearing impairments and those with normal hearing often can be attributed to contexts outside of the child.

CONCLUSIONS

The research reviewed in this chapter is not all inclusive but representative of areas identified as important and current focuses in the professional field. A new perspective on children with hearing impairments is reflected: one that emphasizes the child as an individual who, for the most part, moves through the normal developmental process.

Implications for instruction include the following:

1. First, examine the accessibility of the auditory message. Utilize assistive listening devices if available, print, and other visual information.

2. Emphasize the development of concepts first. Visual presentation of content will not be successful if basic concepts around the content are not developed.

3. Emphasize building basic concepts through experience: direct experience with the content of instruction and communication around the content.

CHAPTER 3
VISUALLY IMPAIRED CHILDREN: ABILITIES AND NEEDS

The introductory chapter of this monograph provided statistics on the number of school-aged visually impaired children and explained the legal and functional definitions used to describe the visually impaired population. It is necessary to understand the various subsets of this population and to discuss their conceptual abilities in order to relate these to social studies education. It is only after understanding the characteristics of these children that solutions to these issues can be identified.

SPATIAL COGNITION

Spatial concepts control a wide range of functional skills. They are especially critical for understanding and teaching geography (Downs and Daggs 1990). The ability to describe the relative location of objects, to navigate in a space, to understand how things interact, and to be able to think in a non-sequential mode all involve spatial concepts. Children who do not comprehend these concepts are seriously disadvantaged, even when confronted with the simplest tasks such as understanding the terms right, left, behind, and under (Hill, Guth, and Hill 1985). It is reasonable to assume that ascertaining and developing these concepts might be modality-specific.

Cognitive theorists (Bruner 1966; Gibson 1969; Piaget and Inhelder 1975) have outlined a variety of strategies that are responsible for ontogenetic development and cognitive growth. All agree that visual experience is an important element in this process. Individuals with visual impairment must rely on their non-visual modalities (auditory, kinesthetic, and tactual senses) to perceive and encode information. Information acquired this way, by its very nature, is different in both content and quality than the information received through sight. Because of the prominent role vision plays in the acquisition of information, questions have been raised about the quality, completeness, and functionality of cognitive skills of children who are visually impaired. Does vision loss impact how visually impaired children comprehend language and how they develop spatial skills? If so, what skills are affected and to what extent then are the children restricted in understanding the concepts necessary to develop the basic foundations in a social studies curriculum?

THEORIES OF COGNITIVE DEVELOPMENT

Different theories have emerged on the cognitive development and spatial skills of visually impaired children. Traditionally, it was thought that visual impairment inhibited most areas of development (Terzieff and Antia 1986). Visually impaired children's cognitive abilities were thought to reflect deficiencies. This in turn, prohibited the formulation of a spatial frame of reference. This frame of reference is thought to be necessary to develop cognitive concepts. The ideas behind this "deficiency" theory have not been abandoned. However, there are few supporters of it in its extreme form. Ever mounting empirical evidence has demonstrated that many visual impaired children are capable of spatial competency (Spencer, Blades, and Morsley 1989).

Although, visually impaired children may have adequate cognitive abilities, some believe that the restriction of any type of sensory information is bound to affect the quantity and quality of a child's spatial frame of reference. The effect is on both the child's immediate environment, as well as on a larger, more global environment. These ideas find their support through the theory of "inefficiency." This theory postulates that a visually impaired child does develop a spatial frame of reference, but one which is not as sophisticated and functional as that of a sighted child's. As a result, visually impaired children lag behind in their development. It is thought that these lags are primarily due to the lack of visual capabilities. There is, however, some evidence that these delays in development may be related to experiential deprivation (Terzieff and Antia 1986).

An alternative theory of visually impaired children's cognitive development and resulting spatial skill levels is the theory of "difference." It may be that because visually impaired children rely on non-visual information that perception and organization through non-visual modalities result in different encoding strategies and processes. For example, when we perceive an object by seeing it we collect information that is different than if we were to hear, smell, or feel it. The manner in which this information is then stored, processed, remembered, and used is influenced by the modality that perceived it. Non-visual perception provides different information, and as a result, the visually impaired child's development is different than that of the sighted child. One cannot assume, however, that the non-visual information makes visually impaired children less functional.

EMPIRICAL RESEARCH ON COGNITIVE DEVELOPMENT

The notion that visual experience is a necessary element in spatial learning is evident in the speculations that the age of onset of blindness affects spatial functioning. There is agreement amongst many researchers that having had a period of useful sight is helpful in acquiring spatial concepts (Spencer, Blades, and Morsley 1989). Children who are adventitiously blind (blinded after age 5) are thought to have spatial skills which are superior to those who have been blinded since birth (Spencer, Blades, and Morsley 1989). Their past experiences of acquiring and processing information visually is thought to increase the level and sophistication of their cognitive development and spatial imagery. In contrast, congenitally blind children (blind since birth or before the age of five) are thought to be spatially disadvantaged. These children have never experienced or used visual cues to help them organize spatial information. Performances on Piagetian tests measuring projective space (Birns 1986), however, show no difference between congenitally and adventitiously blind children.

The literature comparing totally blind and partially sighted children has focused on the influence of vision on spatial performance. Although, differences between partially sighted and blind children are thought to be a result of the partially sighted child's ability to use residual vision, the literature (Rieser, Guth, and Hill 1982, Fletcher 1980, and Warren, Anooshian, and Bollinger 1973) shows this may not necessarily be the case. There appears to be no significant difference between the spatial conceptualization abilities of children who are partially sighted and of those who are totally blind (Hill, Guth, and Hill 1985). There are significant differences in learning strategies within these groups, but not between them (Miller 1982, Simpkins and Siegal 1979). The assumption that partially sighted children, because of their visual capabilities, have better spatial knowledge than totally blind children is not substantiated by these studies.

Some of the comparative studies on blind and sighted children (Garry and Ascarelli 1960, Hill and Hill 1980) in fact, contradict the difference theory. Visual impairment slows down development but does not prohibit it. These studies show that visually impaired children are more like their sighted counterparts in

their ability to develop a spatial reference frame. Development may be hampered due to vision loss, but not restricted. Their loss of vision does not necessarily result in loss of spatial imagery, but affects the reliance on alternative sensory systems (Spencer, Blades, and Morsley 1989).

This reliance is evident in the way a visually impaired child develops a spatial framework in the context of mobility. In order to navigate successfully, a visually impaired child uses auditory, olfactory, and kinesthetic cues derived from the environment. The environmental information is egocentrically coded into a "haptic" image (Spencer, Blades, and Morsley 1989). There is a tendency to think that these haptic images are sequential because it has been assumed that visually impaired travellers are not capable of making the spatial connections between the routes they travel. Mobility studies specifically designed to measure this phenomena (Passini and Proulx 1988, and Passini, Proulx, and Rainville 1988) show that even congenitally totally blind persons acquire spatial cognition through travel. This indicates that a visually impaired person's reference frame is not necessarily restricted to sequential, linear information as was previously thought. It is speculated that haptic imagery is a substitute for visual imagery in this case and allows spatial cognitive development to take place in the absence of vision (Passini, Proulx, and Rainville 1988).

Given the empirical research on cognition of the visually impaired it is probable that experience, more so than vision, is one of the key components in the developmental process. The experiential base developed through mobility is, therefore, important to the development of a visually impaired child's spatial frame of reference. Actively moving and interacting with the environment helps a child build and test their spatial skills. Through this type of activity they are able to progress from an egocentric based perspective to a geocentric one.

Unfortunately, visually impaired children are frequently less active than their sighted counterparts. This inactivity starts at infancy for many visually impaired children in the form of restricted and delayed motor experiences. Under these conditions they receive less environmental stimulation and fewer exploration opportunities. With limited mobility they encounter fewer direct experiences with their immediate environment, which in turn results in both social and spatial isolation (Spencer, Blades, and Morsley 1989). These limits of experientially based information are an impediment to the spatial development of some visually impaired children (Hatlen and Curry 1987, Terzieff and Antia 1986).

DEVELOPMENT OF LANGUAGE AND INTERACTION SKILLS

It seems only natural that a visually impaired child would rely heavily on their auditory sense and verbal communication to help them learn and form ideas. The myth exists that the auditory capabilities of a visual impaired individual are superior.

The fact is that hearing is neither positively nor adversely affected by one's visual impairment. Vision loss does not change the physiological characteristics of one's auditory sense. It does, however, make visually impaired individuals more reliant on their remaining senses as a means of acquiring information and as a result, the visually impaired person might be more attentive to information and cues presented in this mode.

LANGUAGE COMPREHENSION

Although, hearing is perceptual and not affected by vision loss; language comprehension on the other hand, is a cognitive function. It is acquired through experience. There is some evidence that visual impairment may have some influence on language comprehension.

Visually impaired children are taught many of their spatial concepts through verbal descriptions. The process of receiving and organizing verbal information is considered sequential and temporal, not spatial. The result is that a visually impaired child is attempting to comprehend a spatial concept via a non-spatial framework, rather than a spatial one provided through visual links to information acquisition (Battachi, Franza, and Pani 1981).

This may be why some research (Birns 1986) indicates that a visually impaired child's use of spatial terminology is delayed. The child has no referent to objects other than the verbal description. These delays are very apparent when visually impaired children are asked to describe geographic features and the result is poor scores on exercises that test their knowledge of basic geographic concepts (Franks and Nolan 1970, Franks and Baird 1971). Additional research (Andrews 1983, McGinnis 1981, and Anderson and Olson 1981) supports the differences between the spatial word choices and definitions of the visually impaired and sighted. In general, visually impaired individuals use a limited spatial vocabulary.

Here again, experience seems to play a key role. Words and word-meaning associations are based on experience (Harley 1963). How a visually impaired child's verbal abilities develop are closely associated with the type of experiences he/she has to attach meaning to words. A visually impaired child may not comprehend the concept or meaning being described if they have never "seen" it or experienced it. Their association with the word becomes quite different than that of the sighted child's.

McGinnis (1981) labels this phenomena as the difference between "linguistic description" and "linguistic representation of a visual distinction." For the visually impaired child, a word may describe a concept for which the child has no referent, whereas the sighted child has the experience of seeing the object. The visually impaired child's limited spatial sensory experiences prohibits his/her comprehension of the visual vocabulary often used for explaining spatial concepts.

LANGUAGE COMMUNICATION

There is evidence that vision loss affects communication and that visually impaired children do not possess the same communication skills as their sighted peers. One theory for this is that social communication skills (e.g. initiating conversation, not interrupting. . .) are developed from visual observation (Hatlen and Curry 1987). The visually impaired child is at a disadvantage, not having observed the proper visual protocol. These poor social communication skills end up interfering with the interactive skills of visually impaired children in the classroom (Hatlen and Curry 1987, Parsons 1987). Visually impaired children are observed as having fewer social interactions in the classroom than their sighted peers (Hoben 1976). This limited social interaction in turn may contribute to cognitive delays (Terzieff and Antia 1986).

COGNITIVE AND LANGUAGE SUMMARY

What is clear from the cognitive and language literature on visually impaired children is that there are conflicting theories and conclusions as to how these children develop and comprehend spatial concepts. Information on how their spatial imagery compares to their sighted peers is no clearer. Part of the confusion is due to the tremendous variations in what measures are used to test spatial abilities, the environmental scales at which they are tested, the non-visual aids used for testing, and the vocabulary used for instructions and analyzing results. The problem is further complicated by the heterogeneity of the visually impaired population. There are major differences amongst individual conditions of impairment (e.g. type, degree, and age of onset). There are also major differences in the type and amount of spatial experience each child brings into the learning situation.

There is no question that if a teacher is not cognizant of the specific instructional needs of each visually impaired student that the quality of education for that student suffers. The cause is not solely related to the student's lack of vision. There appears to be mounting evidence in support of the theory that visually impaired children are not necessarily cognitively different from their sighted counterparts, but rather that their limited access to nonvisual materials exposes them to different experiences.

INSTRUCTIONAL NEEDS IN GEOGRAPHY

Geography education relies heavily on visual graphics. Films, photographs, slides, maps, and flowcharts are often used to explain the concepts of place, movement, interaction, and change. Some of the problems experienced by visually impaired children in geography classrooms are that they are denied access to shared learning experiences because a substantial amount of this supporting material is visual (Miller 1982). This makes it quite difficult for the visually impaired child to achieve geographic literacy (Miller 1982).

There are basically two strategies a teacher can use to meet these needs: 1) adaptation of the curriculum or 2) a change of the curriculum. Adaptation of the same curriculum offered to sighted children has been the traditional approach in teaching visually impaired children. This mode of instruction relies heavily on oral and recitation techniques (Hatlen and Curry 1987), and the tactual replication of visual materials. Under this model, auditory or tactual presentations are translated directly from existing instructional materials that were intended for sighted students. While it is advocated that visually impaired children have access to the same information as their sighted peers, the solution is not merely to recreate this information in a form perceptible by their remaining senses. Words cannot always be substituted for pictures. Illustrations cannot merely be raised images or enlargements of existing visual forms.

It is important to carefully structure the learning activities for visually impaired children so they are capable of comprehending and developing key concepts (Barraga 1976). This means that teachers need to develop multi-sensory materials that are meaningful to the visually impaired student (as well as other students in the classroom). There are a variety of methods teachers can use to produce and reproduce the graphic materials depending on the needs of the student.

The majority of students, approximately 70 percent of the visually impaired child population, use large print, regular type, or magnified regular type (Blasch and Brouwer 1983). These students cannot merely be

given an existing visual graphic to use. Illustrations or maps that are printed in regular type are too detailed and complex for many partially sighted children to read. The images often have multiple grey shades in the form of halftones or colors. Merely enlarging the image with some optical device does not make it any easier for them to read it. Illustrations need to be designed so that extraneous detail is eliminated when it interferes with legibility.

For the totally blind or severely partially sighted student the graphic information will need to be in tactual form. Unfortunately, it is all too common a practice to exclude graphs, illustrations, or maps from braille textbooks. In their place a caption reads "illustration omitted see teacher." This approach restricts the visually impaired student's perception and concept of what that map or graphic could have communicated to them. The description is left entirely up to the subjective interpretation of the teacher. The child is not able to form his/her own ideas from the information presented, but rather is given the idea from the teacher's perspective.

Creating tactual graphics and maps requires special design considerations. The graphics and maps cannot simply be raised forms of the visual product. When designed properly, tactual maps have been shown to be effective teaching devices (Miller 1982) and visually impaired children are quite successful in using these maps for improving their concepts of space and geography (Andrews 1983, Morsley and Spencer 1988). The maps allow them to link abstract terms to the real world. Students tutored with maps demonstrate impressive gains in their knowledge of place and relationships (Miller 1982).

Some students may encounter perceptual, cognitive, and behavioral problems when initially faced with reading a tactual map (Dodds 1989), and teachers need to be aware that there are substantial individual variations in visually impaired children's map reading skills (Hampson and Daly 1989). These difference are thought to be a result of differences in tactual sensitivity, tracing skills, scanning strategies, ability to identify and discriminate, motivation, map reading experience, and quality of the tactual image. The way a map is used is also an important factor in comprehension. Take for example mobility maps used for pedestrian travel: the skill required to coordinate the reading of the map with actual travel is a complex and difficult task (Hampson and Daly 1989).

Congenitally blind children usually have little or no previous map experience. They generally initially exhibit poorer conceptual understanding of the map and its relationships than the adventitiously blind do (Wiedel and Groves 1972), and they have a difficult time associating a map with reality (Berla and Butterfield 1975). After limited exposure and map training, however, their tactual map reading skills improve (Barth 1983, Franks 1983). They are able to use maps in the same manner as the adventitiously blind (Andrews 1983).

One method of facilitating map reading and comprehension is to start with simple versions of maps and build a hierarchy of knowledge with subsequent maps containing additional elements. Instead of presenting students with one map containing the boundaries of states, rivers, and areas of corn production and wheat production, a teacher can provide students with a number of maps which might include:

1. An outline map of the states.

2. A map that has rivers added to the state map.

3. A map that has corn production areas added to the river and state map.

This method utilizes an additive approach to the conceptual and geographic knowledge a child will form about a place and is advocated as a method for learning for all children, whether visually impaired or sighted.

One problem teachers encounter is producing tactual maps for their visually impaired students. Until recently, this was a very difficult and time consuming task. The last decade has brought about substantial technological advances in this area. A body of helpful literature exists for tactual map design (see Andrews 1988, Epstein 1982 and 1983, Lambert and Lederman 1989, and Wiedel and Groves 1972) and production (Andrews 1985, Turner and Sherman 1986). Teachers are encouraged to consult these articles for more detailed information on preparing graphic materials for visually impaired students. They should keep in mind that visual graphics can not be merely translated into tactual form. The concept being conveyed, discrimination between the symbols used, the legibility, the process used for production, and the skill level of the student are all factors that need to be considered. With the aid of these guidelines and references, however, it is possible for the individual classroom teacher to quickly and inexpensively develop materials to meet the needs of their visually impaired students and enhance the comprehension of social studies concepts for these students.

CHAPTER 4
DEVELOPING A UNIT OF INSTRUCTION: THE PROCESS AND A MODEL

This chapter describes the process for developing an integrated experienced-based geography curriculum unit. The chapter begins with an overview of the general process one would use to develop an integrated experience-based unit. The unit is briefly described within this process. Aspects of the unit are discussed with respect to the development of each of the major parameters of an integrated experienced-based unit. The major parameters are integration and experience. General teaching strategies and examples of how to implement them in the unit are provided. Although the entire unit is not presented in this chapter, the appendices provide detailed examples, such as an outline of social studies curriculum content integrated into the unit (Appendix A), a week-by-week plan (Appendix B), an outline and detailed description of activities for one week (Appendices C and D), and a fully developed plan for one lesson (Appendix E). Teachers can use these materials to develop their own plans and activities. In addition, a bibliography of books and other resource material is included (Appendix F).

To develop this unit, a slice through the curriculum model presented in Chapter One is extracted and shown in Figure 2. This unit is prepared for grade 4, but the general techniques could be adapted to fit the needs of children at any grade level in an elementary curriculum. The development of the child, areas of the general curriculum, and tools such as language and communication are wrapped around three broad conceptual strands. It is proposed that these strands be emphasized throughout the elementary grades.

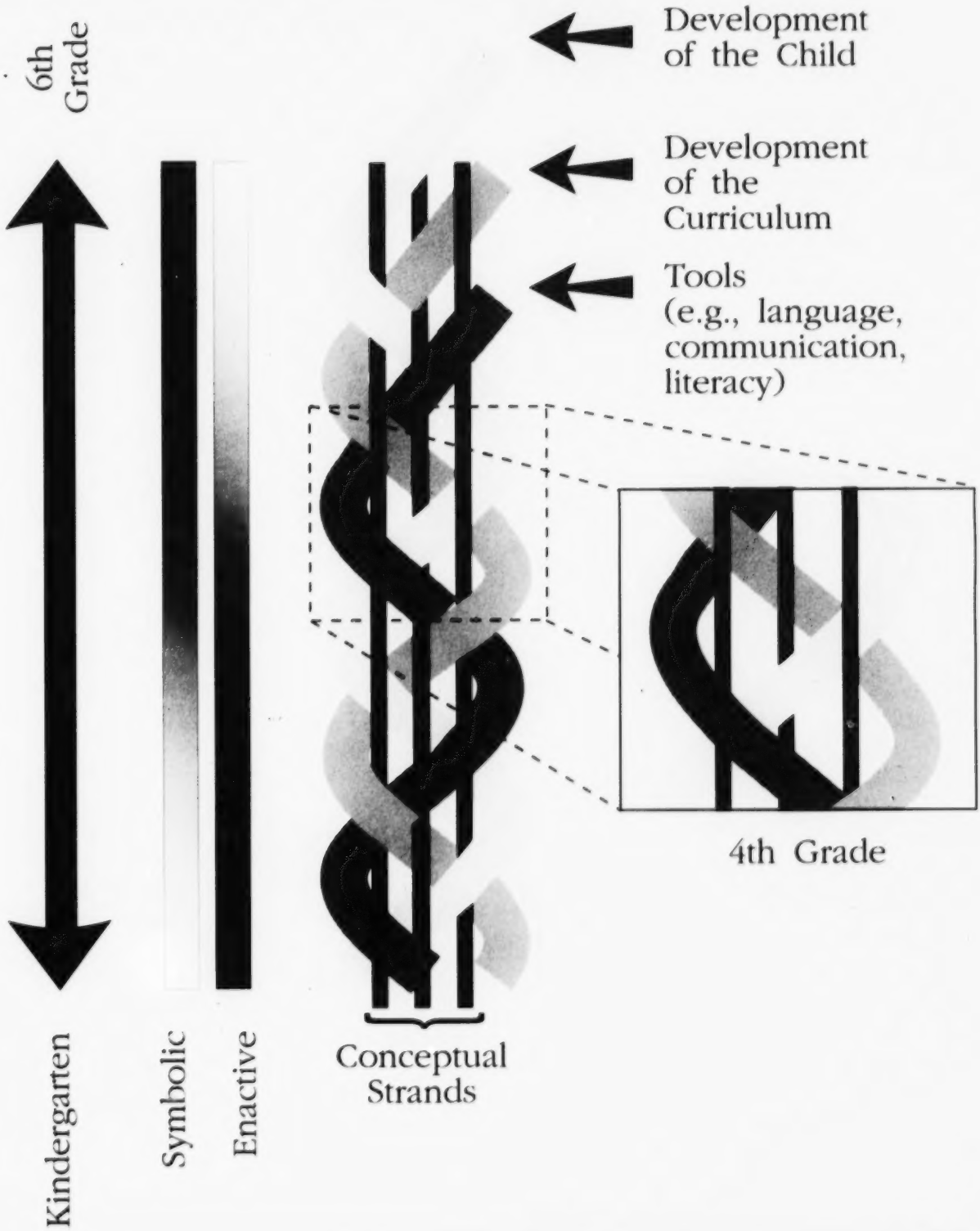
In developing this unit, as any unit of study, a theme or focus needs to be identified. This theme provides a base on which topics can be drawn and learning experiences developed. This unit is based upon the story and content presented in a book entitled, *Paddle to the Sea* by Holling Clancy Holling (1941).

Paddle to the Sea was chosen because it integrates a variety of content into a narrative form. *Paddle to the Sea* is the story of a voyage of a miniature wooden canoe that travels through the Great Lakes and across the Atlantic Ocean to France. The canoe is launched by a young Native American boy who lives in the mountains just beyond Lake Superior. On its voyage to the ocean, the canoe is introduced to a variety of geographic features (e.g. marshes, swamps, rivers); economic practices (e.g. lumbering, shipping, mining); sociological/cultural interactions (e.g. Indian, French-Canadian, American); and environmental processes (e.g. water cycle, ecological systems, and pollution). Holling develops each of these experiences just enough to create a framework for a course of study within which integrated and experience-based learning can be achieved.

THE PROCESS

The overall process for developing an integrated experience-based geography unit is "top down." One proceeds from the broad themes through a series of planning activities to the individual daily lessons. First, relevant aspects of the broad conceptual strands are clarified through the development of conceptual statements. Next, topics of study are identified for each of the conceptual statements. Topics which have the greatest potential for developing all of the concepts are highlighted for instruction. Third, an overall

Figure 2


6th Grade
Development of the Child
Development of the Curriculum
Tools (e.g., language, communication, literacy)
4th Grade
Kindergarten
Symbolic
Enactive
Conceptual Strands

framework for organizing and managing the unit is created. Fourth, a general plan for learning experiences week-by-week is sketched out. Finally, detailed plans for learning experiences (activities) are fully developed for a week of specific lessons.

The unit plan should be in accordance with the major parameters of the curriculum model: integration and experience. Relevant objectives from the elementary social studies curriculum should be integrated. Integration of the curriculum content can be achieved by developing learning experiences that cut across the content areas (reading, writing, language, science, geography, and math). Teachers can identify specific learning objectives that address the learner expectations of their curriculum through activities. These activities can be developed to provide all students in the classroom rich multi-sensory experiences that make teaching and learning meaningful and fun.

THE *PADDLE TO THE SEA* UNIT

INTEGRATING CONCEPTS AND CONTENT

Three conceptual strands are chosen which stretch through the curriculum spiral and create the cognitive framework for social studies instruction. These are INTERDEPENDENCE, EVOLUTION/CHANGE, and CULTURAL DIVERSITY. Conceptual statements, which are descriptive sentences clarifying and specifying those concepts, are developed directly from the conceptual strands (Figure 3). The expectations in the Milwaukee Public School System for students studying social studies at the fourth grade level provide the ideas for the conceptual statements for each conceptual stran. (See Appendix A). These learner expectations are harmonious with those identified by the National Commission on Social Studies in the Schools (1989) and reflect a typical curriculum.

The integration of content is achieved, in part, for *Paddle to the Sea*, through the identification of topics which provide opportunities to interact within various content areas. A web is created for each concept and the conceptual statement by identifying possible topics which are relevant to the story (Figure 4). Possible topics identified for INTERDEPENDENCE are: recreation, water cycle, transportation, weather and water function, adaptations of natural environment such as locks and canals, industry's impact on the environment, ethics, and the economics of industry as it relates to vocation. Topics for EVOLUTION/CHANGE are: cities, cultures, recreation, industry/the economy, and geographical features. Topics for CULTURAL DIVERSITY are: dependence and use of water, attitudes and beliefs about water, habitation, subcultures created by vocations around water, and ethics. Topics, such as these offer opportunities to include content outside of the social studies within the unit (e.g. science and math).

OVERALL FRAMEWORK OF THE UNIT EXPERIENCES

Paddle to the Sea is a book with eighteen chapters. Thus, the unit is organized across eighteen weeks, and focuses on approximately one chapter per week. For each week's reading, the content in the text is matched with concepts and topics which could be developed for classroom use (see Appendix B). In addition, the teacher should identify specific learning objectives for the activities suggested in the "Week Plan" (Appendix C) and the "Week in Detail" (Appendix D). Each activity has multiple objectives. For example, the objectives of the interview activity are for students to learn how to write questions, determine what information is relevant to the task at hand, develop oral communication skills, and interact with others.

Figure 3

Strands

	Conceptual Strands	Conceptual Statements
A.	INTERDEPENDENCE	People are dependent upon the environment, and the environment is dependent upon people.
B.	EVOLUTION / CHANGE	Changes in technology change life-styles and interactions with water (then & now, '41 & '91)
C.	CULTURAL DIVERSITY	There is assimilation between cultures (around water).

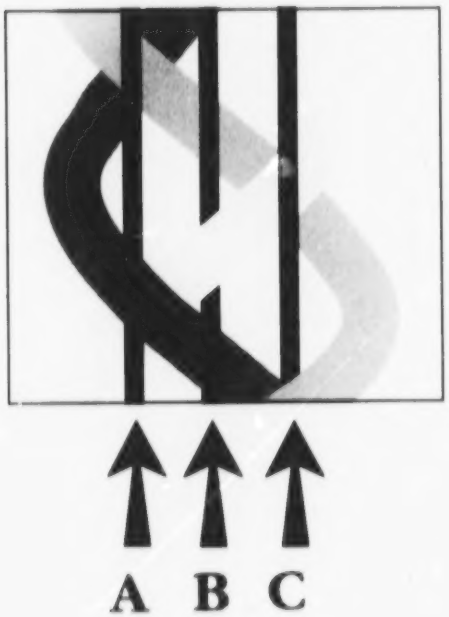
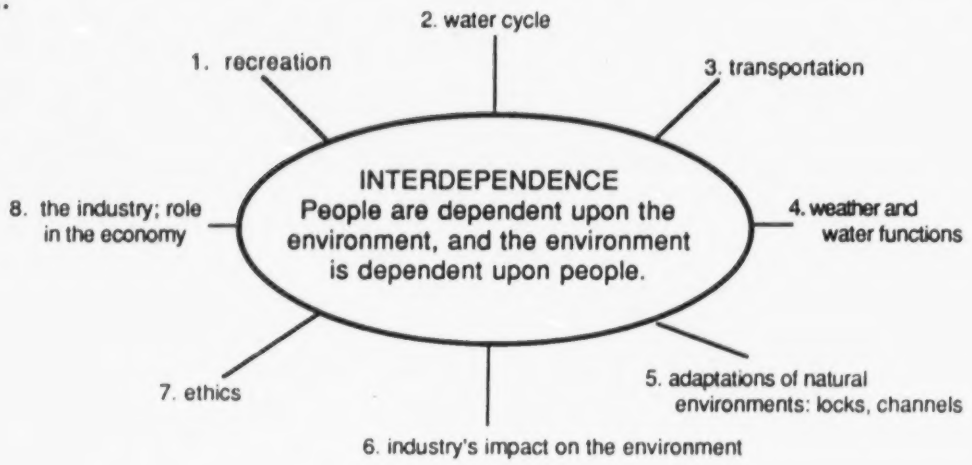


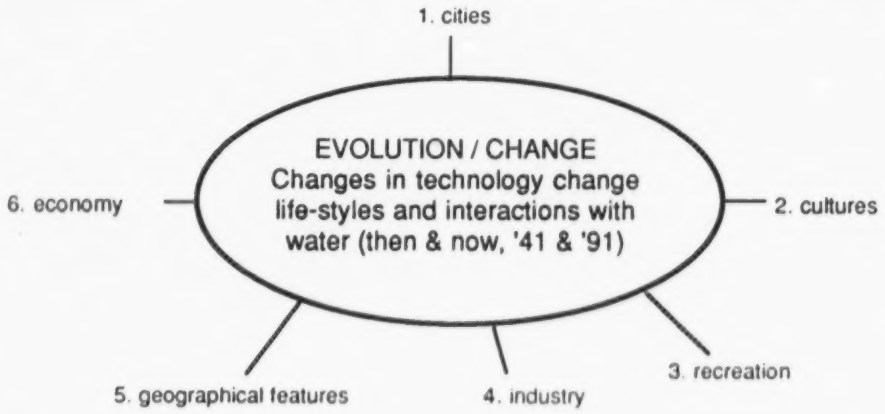
Figure 4

TOPIC MAP

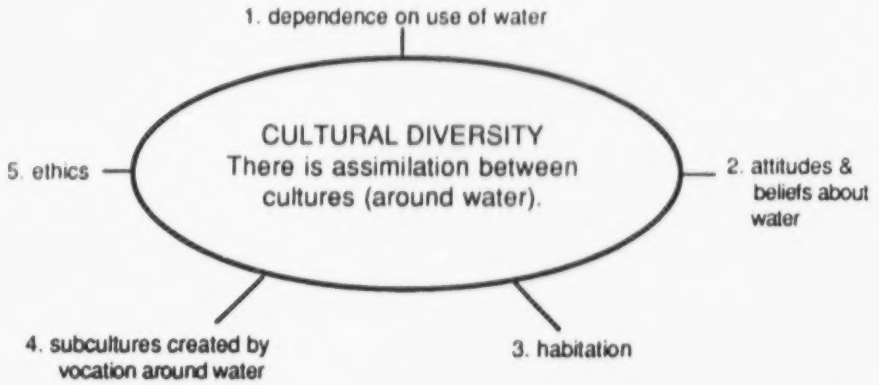
A.


2. water cycle
1. recreation
3. transportation
INTERDEPENDENCE
People are dependent upon the environment, and the environment is dependent upon people.
8. the industry; role in the economy
4. weather and water functions
7. ethics
5. adaptations of natural environments: locks, channels
6. industry's impact on the environment

B.



C.


1. dependence on use of water
CULTURAL DIVERSITY
There is assimilation between cultures (around water).
5. ethics
2. attitudes & beliefs about water
4. subcultures created by vocation around water
3. habitation

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The shared experience in the unit is emphasized by assigning children to Lake Groups (five groups, one for each of the Great Lakes—Ontario, Erie, Huron, Michigan, and Superior). This is done in order to be able to cover all of the relevant content and to help students go into each of the concepts of the unit in depth. The members of each group become experts on their lake, eventually sharing that information with the other students in the class. Children can plan activities, work together, and interact on a formal and informal basis.

Other critical features of the overall framework are the initiating and culminating activities. Children will come to this learning situation with a variety of experiences and background knowledge, not all the same. An initiating activity is developed in order to assess the class's prior knowledge of the theme and to provide common experiences on which to begin and build the course of study. The initiating activity planned for this unit is a visit to the lake front and a canoe ride. For students who have never had this experience, their concepts about such things as water, water travel, and recreation will be formed. For children with sensory losses, the visual, tactile, and communication experiences involved in this excursion are tangible. They will have experiences and sensory stimulating activities which will allow them to attach meaning and significance to what is taking place in the story.

These sensory experiences are linked with meaningful communication. The culminating activity is designed to utilize the products that children develop throughout the unit. The culminating activity can be a "Voyage Fair." At the "Voyage Fair," each Lake Group could present information and the products they developed to represent and/or describe their designated lake. For example, after a group has researched aspects of their lake they could compile written summaries of their findings into a "Big Book." Additionally, children can be encouraged to develop brochures advertising their lake to potential tourists, create folk tales around historical events, and develop maps which illustrate various characteristics of the geography and population. These products would be displayed in a booth and shared with other children in the class and the school. It is through this type of culminating activity that children can see themselves as the content area "experts."

ENACTIVE AND SYMBOLIC LEVEL EXPERIENCES

In addition to the concept of integration, experience-based activities are an important aspect in the *Paddle to the Sea* Unit. The experiences are oriented around communication, literacy, and content with a multisensory approach. Enactive (direct) and symbolic (experience mediated through language) level experiences are evident as priorities. Enactive experiences which serve to create the foundation for later learning within the Unit include a canoe trip (the initiating experience), a visit to a lumberyard, paper mill, and shipping docks, and river hikes to explore the terrain, plant, and animal life first-hand. These experiences should be structured so that the children are prepared ahead of time and can gather the information to document their experiences in individual or group writing activities (see Appendix C for the weekly plan of activities for a trip to the lumberyard).

Symbolic level experiences are encompassed within the language, communication, and literacy activities which are the "glue" holding the Unit together. Routines are developed which emphasize symbolic level experience. The topics selected by the groups provide a vehicle for communication among peers, creating a framework of collaboration, sharing of strengths and weaknesses, and a variety of communication partners. For example, in the area of reading, the group could develop a Book Club. The club would select books reflecting the unit themes, read and discuss the books, and maintain a log of everything they read throughout the unit.

GENERAL STRATEGIES AND EXAMPLES FOR IMPLEMENTATION

In Appendix C we present a lesson plan for a unit in the *Paddle to the Sea*. In this section on general strategies and examples for implementation we provide specific instructional ideas for implementing the activities for this week. The activities are compatible with the concepts upon which the integrated experienced-based unit was built. First, we provide some general strategies for teachers to follow. Second, some specific ideas that facilitate the teaching and learning process related to the *Paddle to the Sea* unit are described.

GENERAL STRATEGIES

We have stressed that teachers need to be cognizant of individual student needs in order to make sure that integration of all students into classroom activities is accomplished. There are a number of general strategies that can be followed to facilitate access to information and participation of sensory impaired children. A few of these general strategies are described below. The strategies are detailed in the subsequent section and related to specific activities in the *Paddle to the Sea* unit.

Some general strategies to follow in the classroom include:

1. Maintaining an awareness of accessibility of information through visual, auditory, and tactile senses.

2. Emphasizing the use of printed materials for students with hearing losses, and the use of braille or large type for students with visual impairment.

3. Emphasizing the use of multi-sensory examples.

4. Soliciting participation from the student.

5. Realizing that students with sensory impairments need an opportunity to develop a cognitive framework from which to develop important concepts during instruction.

6. Utilizing appropriate resources and making them available to the child at the appropriate times.

- **Maintaining an awareness of accessibility of information through visual, auditory, and tactile senses.**

Clear sensory input during instruction is important for all students in the classroom, but in particularly for students with sensory impairment. It is useful to arrange the seating of students to maximize accessibility to visual and auditory information. This preferential seating provides for clear verbal input as well as auditory input that can signal and orient students to the activity and movement during instruction. Students with hearing losses should have full view of all instructional materials and of the instructor's face. Typically, they are best seated in the front of the class. During shared readings students with hearing losses should be given the option of using a copy of the book to read along. Because it is so important that students with visual impairments hear the teachers, they should also be seated in the front of the class during instructional activities. Visually impaired students should be provided with a braille, large print, or tape version of all instructional materials and be encouraged to read in any group reading.

- **Emphasizing the use of printed materials for students with hearing losses and the use of braille or large type for students with visual impairment.**

During discussions and reviews of reading, refer to print or braille to emphasize points made. This might involve writing ideas, words, or phrases on the board or overhead, or recording them on tape. Implement strategies such as visual or tactile story mapping or concept diagramming to provide a graphic illustration of the material read and discussed by the group.

- **Emphasizing the use of multi-sensory examples.**

When visual information is presented, determine ways to provide a tactual example. When auditory information is presented provide a written or visual example. Using a multitude of sensory examples to demonstrate an object or concept not only ensures full participation but also reinforces the materials presented.

- **Soliciting participation from the student.**

Capitalize on the potential contributions each student can make. Each student will have something to report about a field trip. Thus, the field trip provides each student with an opportunity to make some type of language-related contribution to the class. If the class has been given a library assignment each student will have something to report about the resources they found in the library. Auditory and visual communication generated by not only the teacher but also by other students is important. All students should be sensitized to the communication needs of the visually and hearing impaired.Other students in the group and/or class should be made aware of the accessibility of their own speech and communication to others. Point out the need to speak clearly (but not exaggerated) and to keep hands, pencils, and other materials from covering the face. Additionally, monitor distracting noises and movements students make inadvertently (such as tapping of pencils, shuffling of feet, rotating head movements etc.). Attention to these aspects helps to promote student-to-student communication.

- **Realizing that students with sensory impairments need an opportunity to develop a cognitive framework from which to develop important concepts during instruction.**

Access to relevant materials ahead of time can help students create such a framework by calling up their own background knowledge and facilitating the prediction of what they will encounter within a unit of study. Prior to beginning a unit, provide the student with a copy of the story and other related materials. Parents and students then have the opportunity to pre-read the story and preview information. Repetition of readings and discussions in class will further build and validate the student's information base, and help them to develop concepts.

- **Utilizing the appropriate resources and making them available to the child at the appropriate times.**

Many hearing impaired students are fitted with assistive listening devices which provide a microphone for the teacher. Find out how to use this equipment effectively. Additionally, sign language or oral interpreters may be provided for the child. Visually impaired students also have access to special equipment and services. These might include braille, large type, or tape books, optical reading devices, NOMAD (a tactile-audio device for the acquisition and management of spatial information), and facilities available for the creation of tactile materials. The teacher should also identify activities where such services facilitate the accessibility to information but do not inhibit natural communication within the classroom between the student and his/her teacher and peers.

EXAMPLES FOR CLASSROOM IMPLEMENTATION

Each of the suggested activities in Appendix C (Week Plan) and D (The Week in Detail) require additional development by the teacher. To assist in this process, we have selected some of the activities from the unit, explained how they might be developed, and provided ways in which to facilitate the learning capabilities of sensory impaired children.

For activities which ask for specific responses, it is often helpful to provide a model of the process and the product (desired outcome) for the students. For example, when students are asked to write questions in preparation for their trip to the lumberyard, they might have difficulty determining the function or purpose of the questions and the grammatical forms associated with questions. It is helpful to initiate the activity with examples of appropriate questions and a rehearsal of interactions for the purpose of "inquiry." This can be done by generating a list of things that the students indicate they would like to find out about lumberyards. Next, translate an item on the list into an oral and written question that one might ask of an employee of a lumberyard. This instructional sequence also provides the foundation for student interviews of the "lumberjack," an activity which is planned later in the week after the students have read the story of Paul Bunyan.

We know that students benefit by repeated exposure to critical vocabulary in print and in conversation, and that this exposure helps develop unfamiliar vocabulary and its associated concepts. Words are given meaning by association with idea, processes, and relationships with other items. The more often these are used in a variety of content, the more a student is able to understand their meaning. For students with sensory losses "technical vocabulary" is often not in their experiential base. Exposure to supplemental reading materials and the use of concept or word maps, individual word banks, and student developed word lists are all possible ways to increase repeated exposure to critical vocabulary. For example, certain vocabulary may pose difficulties for the student when working in his/her group while organizing and labeling artifacts from their trip to the lumberyard. Just prior to the class visit to the lumberyard, generate and organize several lists of terms. Lists might include all the different types of woods (e.g., mahogany, pine, birch . . .) and various machinery associated with the lumberyard (saws, forklifts, flat bed trucks . . .). For hearing impaired students, the printed list along with speechreading cues will be important while braille and large print and/or verbal input will be helpful to students with visual impairments. After the trip, fill in new information on the lists. These lists, then, will become resources for the students to access while organizing and labeling the artifacts they'll gather on the field trip.

Throughout these activities it is necessary to take opportunities to build associations for the children between auditory, visual, and tactile cues and their labels. In preparation for the trip to the lumberyard, integrate objects and activities around relevant processes associated with the lumberyard. For example, "sawing" is an activity which may not be tangible for many students. Bring in a saw and a piece of wood and demonstrate the process of "sawing." Additionally, point out the outcomes, such as, sawdust and newly cut pieces of wood (splinters and all!). The tactile and auditory cues involved in this process should be emphasized. During the visit to the lumberyard, point out how this process is replicated. After the visit, identify the differences between the process experienced in the classroom and the process observed in the lumberyard. Other processes which can be demonstrated include sanding, stacking, organizing, lifting, weighing, etc.

Just as the concept of "sawing" may not be tangible to students, the same may be true for concepts related to economics and pollution. Multi-sensory demonstrations of these concepts, therefore, are appropriate. For example, one aspect of the economy important to this unit is import/export. To illustrate this

concept, have students generate a list of items they use daily that are dependent upon the lumber industry. Items typically found in the classroom include paper, pencils, notebooks, folders, cardboard boxes, toilet paper, tissue, pencil boxes, scissors, etc. Have the students collect these items. Take time to investigate where these products came from by looking on the item or package for the "Made in _____" label and calling office supply stores to inquire about where their products are made. Record where items are exported by tacking up samples on their location of origin on a large simple outline world map and a string leading from the location of your town. Make the map and the information tactual enough for visually impaired students. Have students identify which items were exported the farthest by measuring distances from the location of your town. Use the scale to determine the number of miles the items traveled. Hypothesize about how items were shipped (by boat, air, train, truck). Items which are not relevant to the paper industry but relevant to the students may be included in the activity.

Focusing on science and the experimental process helps to illustrate the concept and potential effects of various kinds of pollution to students. Take for example, illustrating the effects of oil spills on natural wildlife. Take a jar of water and add about one-fourth cup of used motor oil. Let students see and feel the water before and after the oil is added. Then, take a bird feather and dip it into the jar. Again, touch and observe the feather before and after. Throughout this demonstration, have students predict what will happen to the water when the oil is added, what will happen to the bird feather after being dipped into the oil, and what effect the oil will have on a bird in the short and long term. Let students conduct their own demonstrations. Another illustration of the effects of pollution is to take common household products that are introduced into the general water supply, and see, feel, and smell the effects of their presence in water. This could include comparing the effects of biodegradable and non-biodegradable laundry detergents in water. Mixing each detergent with water, shaking, and observing over time illustrates how non-biodegradable detergents do not break down and leave a residue.

It is important to maintain an awareness of the language and communication tasks which are part of the instructional activities. By thinking of potentially difficult language and communication concepts and forms ahead of time, one can be more aware of ways to facilitate understandings. As students work through designing and determining the costs of building a birch canoe, numerous concepts and language structures are utilized. Mathematical problem solving exercises provide students with an opportunity to develop concepts and language around the notion of "dimensions." A scaled diagram of the birch canoe that the students (hypothetically) plan to build can be used in many ways. Using the scale, have students demonstrate the actual size of the birch canoe. This could be done by measuring and drawing the actual dimensions of the canoe on paper and using chairs to mark the length and width of the canoe. Students can also estimate and check the number of people the canoe could hold. Have them compare the actual size of the birch canoe with their ideas regarding the size of Paddle, in *Paddle to the Sea*. Since the actual dimensions of Paddle are not given in the story, students must refer to illustrations and relevant language in the text to estimate the size. Again, introduce actual objects to illustrate the size so that students can see and feel the comparisons.

Non-literal concepts and figurative language will present specific difficulties for sensory impaired students. Comprehension of words, phrases, or ideas which are not reflections of reality but whose meaning depends upon manipulating and exaggerating reality require extensive exposure to visual and/or auditory information to build "out-of-the-ordinary" concepts. In the *Paddle to the Sea* unit, students are introduced to the concept of myths and are asked to create myths of their own after reading about Paul Bunyan, himself a mythical character. The mythical nature of Paul Bunyan can be brought out through defining aspects of his environment in the classroom. This would entail, for example, measuring the distance between Big Blue's eyes, said to be nine ax handles (Big Blue is his ox companion); demonstrating a typical Paul Bunyan breakfast of 300 pancakes by having a pancake breakfast and before eating, stack all the pancakes

up and calculate the difference between the pancakes made to feed a class of 24 students and one giant lumberjack.

CONCLUSIONS

Instruction that emphasizes direct experience with unfamiliar concepts and attends to the sensory aspects of curriculum content and process is vital to the growth and development of sensory impaired children. Teachers who work with the tools necessary to teach the sensory impaired will find that the methods used are also beneficial to the other students in the classroom. It is important to view the unit and instructional activities we have provided as "examples" and "samples" of possible ways to meaningfully integrate sensory impaired students into regular classroom instruction that will hopefully stimulate ideas and activities that teachers can implement in their classrooms. By outlining the general process for developing an Integrated Experienced-Based Social Studies Unit in this chapter we illustrated how experience and integration can be incorporated into the curriculum. The example of the *Paddle to the Sea* Unit highlights how the critical curriculum parameters of integration and experience can be incorporated. The Unit is developed in order to provide all children, including those with a sensory impairment, a course of study which focuses on the development of whole concepts. This is possible if a multi-sensory approach is taken to ensure that all students secure the experience and have the initial shared knowledge base from which to work. Children with varied levels of experience and knowledge, as well as sensory impairments at the start of the unit will benefit academically and conceptually from their individual learning experiences as well as from those of the group.

A common concern of teachers might be that the integration of children with sensory losses into regular classroom activities will result in these children not being able to participate fully in the learning experiences because their visual or hearing loss will prohibit access to important information. The experiential component in the curriculum model presented in this publication actually makes information more accessible to these students. The arrangement of working groups adds to this experience by creating opportunities for communication among smaller groups of children. Negotiating appropriate roles by group participants for different tasks is important to the learning process and it is a skill lacking in many sensory impaired children. Through these groups, children can develop an understanding of the strengths that each has regardless of disability.

Chapters Two and Three of this publication have made mention of potential devices for visually and hearing impaired children which could assist in their learning. Although these devices are important we decided to de-emphasize them in this publication because of time and space constraints and because they are adequately covered elsewhere. We feel that the opportunity for students to participate and communicate in instruction that presents information in a framework which is conceptually complete and experientially based is a critical and overlooked factor in the education of sensory impaired children. The literature on the cognitive characteristics of these children consistently points to the importance of experience.

The social studies curriculum is a vital component of school. Within this curriculum students develop the concepts for understanding and interpreting their physical, social, phenomenological, and economic environments. These concepts provide the underpinning for a child's vision of him/herself within society. Teachers who adjust their curriculums to teach the sensory impaired will not only provide these "special" children with information and experiences which make their lives meaningful, they will also extend the educational and social base of every child in the class.

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APPENDIX A

SOCIAL STUDIES

Grade 4: Enabling Level Learner Expectations

American Studies

Recognize that Native Americans were the first people to populate the United States.

Recognize that Wisconsin is populated with humans from all over the world.

Recognize that Wisconsin moved from a basically agricultural economy to an industrial economy.

Recognize how Robert La Follette sought to involve citizens in their government.

Social Sciences

Describe the topography and climate of the state of Wisconsin.

Describe the lifestyle of Wisconsin's first people, the Native Americans.

Assess the impact of European explorers and missionaries on the area that was to become Wisconsin.

Examine how permanent settlers led to statehood for Wisconsin.

Compare the impact of lumbering, farming, and manufacturing on the history of Wisconsin.

Explain how urban areas such as Milwaukee are important to the state of Wisconsin.

Recognize the impact of the Progressives on Wisconsin's government.

Explain the legislative, executive, and judicial branches of Wisconsin State Government.

Identify the two basic types of local governments found in Wisconsin (city and county).

Explain how citizens of Wisconsin may participate in the national government.

Identify the key elements of Wisconsin economy today (manufacturing, farming, tourism, services).

Recognize how Wisconsin was a pioneer in the area of Women's Rights.

World Studies

Define and illustrate physical features of the earth (plateau, canyon, delta, harbor, etc.).

Explain the causes for seasons.

Describe and locate examples of the four types of forest regions found in the world.

Describe and locate examples of desert regions.

Describe and locate examples of the two types of plains.

Describe and locate examples of mountain regions.

Analyze how different regions affect life-styles of people around the world.

Illustrate that regions are interdependent because of the uneven geographical distribution of resources.

Use contour lines to determine elevation.

Milwaukee Public Schools (1986)
Division of Curriculum and Instruction
Department of Elementary and Secondary Education

Appendix B

WEEK-BY-WEEK PLAN
(18 weeks)

WEEK	CHAPTERS	CONCEPTS*	OTHER COMMENTS
1	1	C 2, 3	Basic concepts; voyage/ travel, maps, distance, chapter by chapter reading, writing style.
2	2, 3	A 2, 4 C 2	Heavy on weather changes; effects on environment and water travel. Indian beliefs re: water, spirits, etc.
3	4, 5	A 4, 5	Move from natural environment to signs of habitation.
4	6, 7	A 6, 8 B 4, 6 C 4, 5	Sawmill industry; then and now.
5	8, 9, 10	A 2, 3, 4 C 3	Focus on Lake Superior, various water environments, boundaries between countries.
6, 7	11, 12, 13	A 3, 5, 6, 8 B 1, 4, 6 C 1, 2, 3, 4	Industries of Lake Superior; iron-ore, fishing and copper.
8	14, 15	A 3, 4 B 5 C 2, 3, 5	Concepts related to destruction and restoration; ethics heavy.

* Codes (A, B, C and 1 - 10) refer to concepts and topics outlined in Figure 4.

9	16, 17	A 3, 5, 6, 8 B 5 C 3, 5	"Send off" experience, e.g. shipping letters off to Canada via freighter from Milwaukee. Locks and channels.
10	18, 19	A 2, 5, 7 B 1 C 5	Lake Michigan coastal focus.
11	20	A 1, 8 B 3, 6 C 5	Tourism, geography focus.
12	21, 22	A 3, 6, 8 B 4, 6 C 1, 2, 3, 4	Focus on Lake Erie; big city harbors, industry; then and now.
13	23	A 2, 5 B 5 C 3	Lake Ontario, Niagara Falls, boundaries.
14	24	A 7 B 2, 5 C 3	St. Lawrence River: "pathway to the sea."
15	25	A 2, 4	Water functions: currents from afar.
16	26, 27	B 5 C 2, 3, 5	Retrace the trip focusing on then and now. "What goes around, comes around!'
17, 18	OTHER STORIES AND BOOKS	REVIEW OF MAJOR CONCEPTS	"VOYAGE FAIR"; literature about other voyages, read tracked by map, reported on, displayed for others Also, responses from Canadian cohort (freighter delivery).

Appendix D

The Week in Detail

The objective of the week's activities will be to make the students more aware of the cultural and economic characteristics of logging communities in the area of the Great Lakes. The activities involve reading parts of H. C. Holling's *Paddle to the Sea* and S. Kellogg's *Paul Bunyan* which highlight the characteristics of myths related to communities involved in the logging industry and/or set in a water-oriented environment; student development of several sets of questions to direct their research; a field trip; a math activity; an interview with a lumberjack; and several process writing activities.

The students will read chapters 6 & 7 of *Paddle to the Sea* and prepare questions to direct their research on industries and their associated cultures around the areas of the Great Lakes.

Monday: Activities include reading *Paddle to the Sea*; developing questions; a field trip to a lumber yard; and writing a group report (Language Experience Story) of the field trip.

- Shared reading will introduce the logging industry and its subculture (chapters 6 & 7 of *Paddle to the Sea*).

- Students will prepare for their field trip to the lumber yard.
  A. The students will develop questions that focus on the following four items: 1) products, 2) size & measurement, 3) import/export and the transportation of products, and 4) price/cost factors.
  B. The students will prepare for building a birch canoe by listing the materials needed and the prices so that they can calculate the cost of building the canoe during Tuesday's math activity.
  C. The students will identify samples of materials or artifacts to collect at the lumber yard. These might include small pieces of wood which show the different types of wood and printed materials available in a lumber yard.

- The students will take a field trip to a lumber yard in their community.

- The students will write a group Language Experience Story describing the field trip. Reference to this story will be made in Tuesday's work.

Appendix C

WEEK PLAN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
•Shared reading: Chapter 6 & 7 of *Paddle to the Sea*. •Preparation for field trip to the lumber yard: develop questions, some will be specific to math. •Visit to the lumber yard.	•Re-read Chapters 6 & 7. Focus on 1) Industry/Economy 2) Environment 3) Culture. •Re-read LEA. •Organize and display samples collected at lumber yard. •Math mini-lesson.	"Paul Bunyan Day" •Shared reading of Paul Bunyan. •Reading mini-lesson on myths. •Process writing, creating myths around their lake. • Individual instruction/ conferences.	•Math mini-lesson from Paul Bunyan. •Reading and group discussion on the environment: develop questions for investigation. •Library visit to locate resources to answer questions.	•Re-read Chapter 6 & 7 *Paddle to the Sea*. •Mini-lesson on metaphorical language of the story. •Process writing on metaphorical descriptions of the geography, culture, economy, and environment of their lake.
AM PM				
•Focus of the field trip will be on 1) Products 2) Size & Measurement 3) Import/Export 4) Price/Cost. •LEA.	•Group work (Lake Groups) gathering information on Industry/Economy.	•Myth reading individuals & pairs. •Mini-lesson on myths and culture, subcultures. •Lumberjack interview. • Process writing about lumberjack subculture.	•Sift through library materials. •Organize information and write on environment as it relates to their lake (e.g., pollution and preservation).	•Begin organizing for afternoon activities. •Sharing of written products developed by each lake group. •Publishing selected products.

Tuesday: Activities include re-reading *Paddle to the Sea*; the reading of students' reports; the organization, interpretation, and display of artifacts; a math mini-lesson; and inquiry into the development of industries around the Great Lakes.

- Chapters 6 & 7 will be the focus of the activities for the remainder of the week. Re-read them. These sections include discussions about industry, the economy, the environment, and the culture of the Great Lakes area.
- To review yesterday's field trip, the students will re-read their group Language Experience Story.
- The students will be divided into groups in which they will organize, label, interpret, and display the artifacts they collected at the lumber yard.
- Conduct a math mini-lesson using materials from the lumber yard and the costs of those materials. Then have the students calculate the costs of building their birch canoe.
- Have the students relate their knowledge and experience with the logging industry to the industries which have developed around the Great Lakes. Students will work in groups to develop questions to direct the gathering of information on the industries. The questions should focus on:
  1) industries around their lake which will identify lake communities (e.g., the paper industry),
  2) geographical characteristics which have made these industries possible (characteristics might include forest areas, canals, and rivers).

Wednesday: Activities include reading Paul Bunyan and a series of myths which relate to the logging industry and life along the shorelines of a large body of water; a lesson on the elements of a culture and a subculture portrayed in myths; an interview with a lumberjack; and process writing about cultures and subcultures associated with the logging industry.

- Students will read and learn about Paul Bunyan and the concept of myths. After reading *Paul Bunyan* and identifying the elements of myth in the story, students will generate ideas for the types of myths which might evolve within their lake community. Have students:

1) read the myths;
2) participate in a mini-lesson to identify the cultural and subcultural characteristics evidenced in the myths; and
3) write and illustrate their own myths.

- Have a guest lumberjack come into the classroom, or dress like a lumberjack yourself, so the students can conduct an interview. The lumberjack is to provide information regarding a subculture which is part of the logging industry and exaggerated in myths, such as *Paul Bunyan:The Great Lumberjack*, by B. Bang. Have students:

  1) develop a set of interview questions for the lumberjack that generate information about the logging industry and the culture and myths surrounding it;
  2) process write around the information they gleaned from the interview and from their reading about cultures and subcultures of the logging industry.

Thursday: Activities include developing and solving math problems; reading a short non-fiction piece on the logging industry and the environment; developing a series of questions about the logging industry and its surrounding environment; visiting the library to collect more resources; and writing specific information about the logging industry and its effect on the environment of their created lake communities.

- Develop and solve various math problems, based on descriptions in *Paul Bunyan: The Giant Lumberjack*. For example, in the story it is written that "Babe, the Blue Ox, grew to be seven axe handles and a plug of tobacco wide between the eyes." After investigating the length of an axe handle and the size of a plug of tobacco students can calculate the distance between Babe's eyes. Using information which connects the size of a bull with the distance between it's eyes, the students can then calculate the size of Babe, the Blue Ox.

- Students will visit the library to collect resources and information regarding the environment/ecology of their created lake. A process writing opportunity will focus on the topic.

Friday: Activities include a reading; a mini-lesson on metaphors; the development of metaphors; and a sharing time.

- Re-read *Paddle to the Sea* and focus on the author's writing style.

  1) Conduct a mini-lesson on metaphors, pointing out those developed in *Paddle to the Sea*.

  2) Have the students develop a list of metaphors which describe aspects of the culture, environment, industry and economy around the Great Lakes. Use this list as a lead into a descriptive writing activity.

- The afternoon will be a time for the students to share and for them to teach one another about the logging industry, culture/subculture and environment of the Great Lakes. Some of the students' written work will be selected for formal publication.

Appendix E

The Lesson Plan

Conceptual Goals: Cultural diversity, cultures and sub-cultures around water.

IEP Objective:
Reading comprehension
Narrative writing
Language - oral and written

Lesson Objectives: Myths will be used for students to develop their reading comprehension and narrative writing skills. Students will be able to apply the basic characteristics of the myth to their comprehension and development.

1. Comprehension will be developed through identification of the basic characteristics of a myth.
   (a) cultural group on which the myth is based
   (b) the hero or main character and his/her special power or gift
   (c) effects of the use of special power or gift

2. Narrative skills will be developed by the students focusing upon a a cultural group and creating a heroine or hero with a special power or gift. Students will then use these basic characteristics to create their own myth.

Materials:
Paul Bunyan by Steven Kellogg
Overhead for semantic mapping activities
Illustrations of Paul Bunyan's geographic "feats" (i.e., the Great Lakes, the St. Lawrence River, the Grand Canyon)

Language Targets: Students will utilize various language targets in oral and written activities. Targets may include the following.

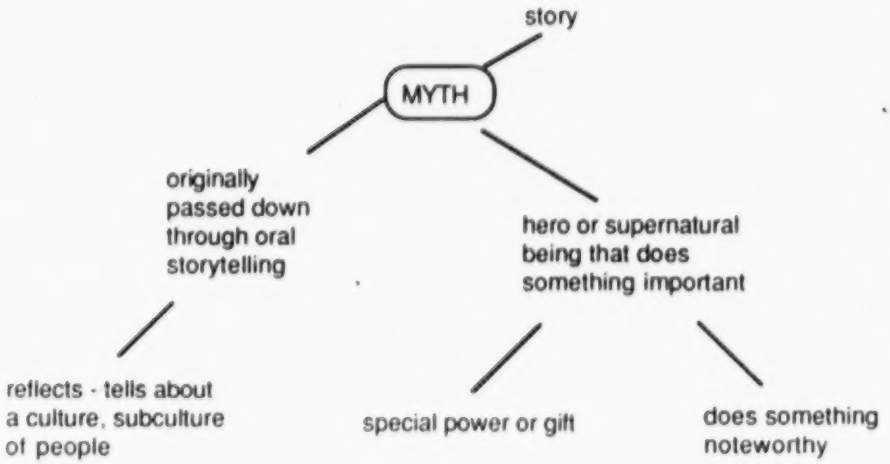
1. Structures which map cause and effect relationships (e.g., Paul Bunyan made the Grand Canyon by dragging his axe.,
   The Great Lakes were created when Paul Bunyan dug holes to transport maple syrup.)

2. Discourse structures: conversational, lesson, and story/narrative.

3. Past tense markers and adverbs of time.

Procedures: 1. Set up reading of Paul Bunyan by conducting a pre-reading activity to identify characteristics of a myth using a semantic mapping strategy.

Semantic map


story
MYTH
originally passed down through oral storytelling
hero or supernatural being that does something important
reflects - tells about a culture, subculture of people
special power or gift
does something noteworthy

2. Read Paul Bunyan to the group. Tell the students to listen for the characteristics of a myth and to raise their hand when they can identify one.

3. After reading the story have the students identify the following aspects.

What is the culture?	What is the subculture?	Who is the hero?
people who live around and depend on water	loggers	Paul Bunyan: hero or supernatural being and special powers

	What happened?	How?
Myth #1	Great Lakes & St. Lawrence River	Dug
Myth #2	Grand Canyon	Axe dragged behind him
Myth #3	Plains cleared	Paul and men

4. Have the lake groups:
   (a) survey the geographical features of their lake around which myths could be developed,
   (b) consider how this feature could have been created by a hero or a supernatural being, and
   (c) identify possible cultural groups that could be represented in the myth.

5. Have each student independently write a myth of his/her lake.

6. Have each student tell his/her myth in the "oral tradition."

Evaluation:

1. Monitor group work.

2. Review written stories for narrative structure and comprehension of myth concepts. Also note written language constructions related to individual goals and objectives of students.

3. Evaluate storytelling and retelling including use of narrative structure, oral communication, and aspects of discourse.

Appendix F

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